

A STUDY OF THE AERIAL INTERDICTION OF  
RAILWAYS DURING THE KOREAN WAR

A thesis presented to the Faculty of the U. S. Army  
Command and General Staff College in partial  
fulfillment of the requirements of the  
degree

MASTER OF MILITARY ART AND SCIENCE

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The opinions and conclusions expressed herein are those of the individual student author and do not necessarily represent the views of either the United States Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

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by

FRANK J. MERRILL, Major, USAF

Fort Leavenworth, Kansas  
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## CHAPTER I

### General Introduction

For the past twenty-five years the United States has been actively involved in a war, hot or cold, that it can ill afford to lose. Our huge defense budget continues to demand a disproportionate share of our overall spending. Critics of this budget demand, and rightly so, that each of these dollars be spent in a manner that provides us with the best defense possible.

The duty of the military and civilian defense planners is to provide this "best possible defense" with the funds made available to them. Every aspect of military operations and equipment must be critically evaluated to insure that the cost versus defense effectiveness is within a reasonable degree of balance. One of the more costly items in the defense budget is the procurement and operation of combat aircraft. Recent trends have been towards a vast reduction in the active aircraft inventory, which indicates that wars of the future will be fought with far fewer aircraft sorties available for the accomplishment of the mission.

This air power limitation makes it mandatory that

the operations planner critically review tactics and methods of air employment. The famous naval theorist, Alfred T. Mahon, evolved a theory concerning this facet of military operations and stated it in this manner: ".... the conduct of war changes rapidly with technological advances. Weapons advance faster than tactics and concepts of war for employing these weapons. Thus military systems always lag behind weapon capabilities." Undoubtedly science and technology have invalidated some current combat tactics and strategy. It is my purpose to study one tactic of air power employment - interdiction.

#### Statement of the Problem

This study undertakes to examine the aerial interdiction activities conducted against the enemy railway system by United Nations' forces during the Korean War, June 1950-July 1953. It has three major goals:

- (1) To compile a brief but concise history of these interdiction activities.
- (2) To evaluate the effectiveness of these efforts as it might relate to the conduct of the total war effort.
- (3) To make recommendations pertaining to the future conduct of aerial interdiction.

#### Scope of study

This monograph will be restricted primarily to

aerial interdiction of the enemy railroad system in Korea. Only general references will be made to other applications of air power and for administrative and logistical procedures required to support the employment of this power. It is recognized, also, that restricting this study to interdiction of railroads only also presents a problem. It will be difficult to eliminate all references to other types of aerial interdiction activities without some loss of clarity or understanding, however, these cross references will be held to a minimum.

#### Historical Development

Operations STRANGLE, the first major concentrated effort at modern aerial interdiction began in the Spring of 1944 during the Italian campaign. By December 1943, rugged mountain terrain, wretched weather and very stiff German resistance had halted the Allied ground campaign along the Gustav Line, just north of the Volturno and Sangio Rivers.<sup>1</sup> The first effort at breaking this ground stalemate was made January 22, 1944, with the amphibious assault on the beaches of Anzio. The beachhead was successfully established, but its establishment failed to relieve significant pressure on

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<sup>1</sup>Wesley F. Craven (ed.), The Army Air Forces in World War II, Vol. III, (Chicago: The University of Chicago Press, 1951), p. 326.

the Gustav Line. In fact, due to the heavy drain on air and ground resources required for the defense of Anzio, it soon became a liability to the overall effort.<sup>2</sup>

The failure to breakout at Anzio and the unsuccessful efforts of the U.S. Fifth Army to penetrate the Gustav Line renewed the idea previously proposed by General Eisenhower at the Cairo Conference in December 1943. He proposed using air power to disrupt the enemy's logistical channels and lines of communication to an extent that would make it impossible for him to halt a major Allied ground offensive.

The use of air power in the role of interdiction had long been a major controversy among the Allied leaders of the offensive. Its critics argued that the limited tactical air power available should be used in close air support and/or other missions of a more immediate nature. On 19 March 1944, despite this strong opposition, MATAF (Mediterranean Allied Tactical Air Force) issued a directive for the interdiction program to begin. It was soon nicknamed Operations STRANGLE.<sup>3</sup> The stated mission of STRANGLE was to "reduce the enemy's flow of supplies to a level which will make it impracticable for him to maintain

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<sup>2</sup>Ibid., vii.

<sup>3</sup>Ibid., pp. 371-373.

and operate his forces in Central Italy."<sup>4</sup>

Marshalling yards, repair facilities and railroad bridges were listed as first priority targets. All fighter-bomber units in the Mediterranean were given targets in the STRANGLE zone. This was an attempt at "simultaneous inderdiction," a phrase which meant that every line leading south from the Po Valley would be cut simultaneously. Medium bomber units were to attack the marshalling yards and the heavier bridge complexes.<sup>5</sup> Fifteenth Air Force strategic bombers bombed rail yards in Northern Italy which were beyond the range of fighter aircraft. These targets proved highly lucrative due to the vast supplies and troops accumulated as a result of the destruction of rail lines and facilities in the south.<sup>6</sup>

Operation DIADEM, the Allied ground offensive, began on 12 May. It soon became apparent to the advancing Allied ground forces that STRANGLE had been a success. General Norstad in his report, "The Assessment of Air Operations Against Enemy Communications; MATAF, Operations DIADEM," stated the following:

Up to the very end of STRANGLE, a static battle front permitted the enemy, by carefully husbanding his stores, from obtaining food at the expense of

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<sup>4</sup>Ibid., p. 373.

<sup>5</sup>Ibid., p. 374.

<sup>6</sup>Ibid., p. 380.

the Italians, and moving in supplies under the cover of darkness by whatever means, to retain and maintain all of his forces on the peninsula. But the air attacks had so disrupted transportation that the enemy was living and fighting with fewer than 4,000 tons per day--which was 1,000 to 1,500 tons less than he would need during an Allied ground offensive. With his lines cut and his transport crippled, it would not be possible to meet the full needs of a practical battle. Already he lacked enough food and clothing. Motor fuel and some types of heavy ammunition were severely rationed, fuel being down to a ten-day supply. Military transport and heavy equipment were either in short supply or badly scattered, and the movement of supplies and reserves was exceedingly difficult. Units coming down from the north were forced to move by motor transport, horse-drawn vehicles, or on foot for long distances and were so often under air attack that they reached the battle area only after suffering heavy casualties, losing much of their equipment and vehicles, and being so dispersed that unit integrity was impossible.<sup>7</sup>

Sir John Slessor, Chief of Staff, Mediterranean Allied Air Forces, in his CS Message 1794, "The Effect of Air Power in the Land Offensive," did not disagree with General Norstad's description of the havoc created by STRANGLE, but further added that air power cannot by itself enforce a withdrawal by drying up the flow of essential supplies when the enemy is not being forced to expend ammunition, fuel, vehicles, engineer stores, etc., at a high rate.<sup>8</sup> DIADEM required him to expend these extra supplies and only then could the true evaluation of STRANGLE

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<sup>7</sup>Ibid., p. 383-384.

<sup>8</sup>John Slessor, The Central Blue, (New York: Frederick A. Praeger, 1957), p. 570-572.



be made. The interdiction of his supplies and the cutting of his lines of communication had damaged him to the point where he quickly used up his supplies and lost his mobility to the degree that he had to retreat.<sup>9</sup>

The preparation phase of operation OVERLORD, the Allied invasion of Normandy, was the next use of interdiction in direct support of a major campaign. The success of the Italian interdiction program resulted in the adoption by the Allies of the "Transportation Plan."

This plan was limited in nature in that it was primarily based on the attrition theory of disruption of lines of communications--a long range program to wear down and ruin the enemy's railway systems by attacking the key rail centers which in turn would result in the destruction of his rail yards, sidings, stations, and repair and control facilities. It was hoped that this would so damage his repair and equipping capabilities that a complete railway chaos would be produced. The normal interdiction activities of armed reconnaissance, rail cutting, bridge destruction and strafing of rolling stock were to be secondary targets. This plan would necessitate the diversion of a large portion of the Eighth Air Force and RAF Bomber Command sorties from deep strategic targets to assist the Ninth Air Force

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<sup>9</sup>Cravens, p. 395.

light bombers and the Fighter Command in attacking preinvasion targets.<sup>10</sup>

The specific proposed targets of the plan were the key rail centers in Belgium and those complexes well north of the major French rail nets leading into the Normandy area. The selection of these targets, actually far north of the proposed invasion site, was meant to indirectly interdict the enemy reinforcing and resupply capability in the Normandy area and also to lead him to believe that we were endeavoring to interdict the Calais area.<sup>11</sup>

Concentrated bombing attacks aimed at the complete destruction of these targets were planned. However, the fear of exposing friendly civilians to these massive attacks seriously handicapped the initial Allied efforts. At first, only a few of the proposed targets were cleared by Allied leaders to be bombed. The results obtained from bombing these limited targets were not significant enough to justify the continued use of this much of the available air power. Tests were conducted to find a tactic that would allow for mass destruction of the target area and at the same time keeping the nearby civilian

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<sup>10</sup>Ibid., 72-73.

<sup>11</sup>Ibid., p. 150.

casualties to a minimum. Mass formation flights, long considered the only effective use of bomber aircraft, were abandoned for flights of six to eight aircraft. Raids were conducted only during daylight hours and only when the weather permitted perfect visibility.

Bombing effectiveness using these tactics was surprisingly good and aircraft losses were light. Bombing accuracy showed a marked improvement and this greatly reduced the danger to civilians. The Allied leaders carefully weighed the effectiveness of these raids against the estimated civilian casualties and concluded that the low casualty rate warranted the expansion of the program. By the end of April, nearly all of the selected rail centers, with the exception of such heavily populated areas as Paris, LeBourget and Nancy, had been approved for assignment as targets.<sup>12</sup>

The expansion of the target list and the widespread damage to these rail centers undoubtedly hurt the Germans, but it was still believed that the overall desired effect was not being achieved. Indications were that only about a third of the rail traffic had been successfully stopped and that the Germans were still able to move troop and supply trains when necessary. Any loss of equipment or

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<sup>12</sup>Ibid., p. 152.

movement capability was merely deducted from that normally allotted to the French and Belgian economy.<sup>13</sup>

During May 1944, the "Transportation Plan" was expanded to include the entire scope of a total interdiction effort. Portions of all elements of the Allied Air Forces were committed in an all out interdiction program. Wide-scale fighter sweeps against rolling stock, principally moving trains, were authorized. In a two-week period these sweeps resulted in damage to over 475 locomotives and rail lines were cut in 150 places. The most productive of these attacks were the "Chattanooga Choo-Choo" missions conducted on the 21st, 25th, and 29th of May and on 2, 3, and 4 June. On each of these days over 1000 fighter aircraft ranged over the northern half of France, the western portion of Germany and in the Belgian lowlands. These sweeps resulted in a near complete disruption of enemy traffic and the loss by the Germans of a vast amount of valuable equipment and manpower. The psychological effect on railroad personnel was very good. French crews deserted in large numbers. German crews had to be employed on all hazardous runs. Daylight railway operations were greatly curtailed.<sup>14</sup>

Probably the single most decisive phase of the

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<sup>13</sup>Ibid., p. 153.

<sup>14</sup>Ibid., pp. 154-156.

interdiction program was the success of the bridge destruction efforts. Long a matter of dispute among ranking Allied leaders, this vital portion of the interdiction campaign was practically forced on them. Its detractors had said that bridges of steel construction were too difficult to hit and were too strongly defended to make them worthwhile targets. Further, they stated, the amount of bomb tonnage necessary to destroy a bridge was completely out of proportion to the benefits gained from its destruction. However, pressure exerted by the many who favored bridge destruction resulted in an experimental attack by RAF Typhoons on 21 April 1944. Several French and Belgian bridges were attacked, and though they were not destroyed, they were rendered unusable. This moderate success resulted in an order issued in early May which directed the destruction of bridges over the Albert Canal and the Muese River, an enterprise that would once again indicate an Allied interest in the Calais region, but which would greatly assist in the indirect interdiction of the Normandy area. Bridges in the immediate invasion area were to be destroyed just prior to or after D-Day.<sup>15</sup>

D-Day brought an end to the need for secrecy and selected bridges on the Loire were opened for attack. Only

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<sup>15</sup>Ibid., pp. 156-159.

four of the seventeen bridges over the Loire were standing by 13 June. Four hundred trains had passed over these bridges in the first week of April but no more than fourteen did so during the week ending on 16 June.<sup>16</sup>

The effectiveness of any interdiction effort must be related to how it influenced the ground battlefield. The availability of post war Germany records make this analysis possible.

As soon as it was definitely known that the Normandy area was the focal point of the Allied invasion, the Germans made every effort to reinforce its defenders. Von Runstedt's Seventh Army and Rommel's Army Group B were alerted to move to reinforce. Post war interrogation of staff officers of these two forces revealed that forward movement was next to impossible after the first few days of the invasion.<sup>17</sup> Von Runstedt described the results of the rail interdiction program as "catastrophic."<sup>18</sup> One unit, the 265th Infantry Division, needed nearly a full week to travel 100 miles by rail. The 9th and 10th SS Panzer Divisions, enroute to the Eastern Front, were recalled from the Lwow area in Poland. The final 200 miles to the battlefield took as long as the previous 1300 miles across Germany had taken. These much

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<sup>16</sup>Ibid., p. 215.

<sup>17</sup>Ibid., p. 220.

<sup>18</sup>Ibid., p. 218.

needed divisions did not appear on the Normandy front until late in June.<sup>19</sup> A Seventh Army diary entry on 11 June indicated that "troop movements and all supply traffic to the army and within the army sector must be considered as completely cut off."<sup>20</sup>

Initially, all German efforts were directed at reinforcing its defending troops and the normal flow of supplies to the front dropped to a trickle. This was soon felt all along the front and on 29 June, the 2nd SS Panzer Division was forced to report its regret that "the attacking Panzer units cannot bring up all their tanks owing to a lack of fuel."<sup>21</sup> Only an estimated 3000 tons per day were delivered against a quartermaster's demand of 7000.<sup>22</sup> After 21 June, daylight movement of trains was permitted only on special orders.<sup>23</sup>

There is no doubt that near isolation of the Normandy area was achieved by the "Transportation Plan." The OVERLORD force was of necessity smaller than the forces which the

<sup>19</sup>Ibid., pp. 220-221.

<sup>20</sup>Ibid., p. 222.

<sup>21</sup>Ibid., p. 223., (extracted from a German 7th Army phone log entry, 29 June 1944.)

<sup>22</sup>Ibid., p. 224.

<sup>23</sup>Ibid., p. 217.

Germans could have brought against it--had they had the full use of the railways and highways of France.<sup>24</sup> It would be, however, entirely false to attribute the German's failure to seriously challenge the Allied invasion solely to the success of the interdiction program. "Equally conspicuous in the causes therefore were the initiative, courage, and perseverance of the Allied ground soldiers who promptly applied and constantly maintained a relentless pressure at critical points on a growing front."<sup>25</sup> However, "the enormous importance of the intensive air bombardment of the enemy's rail communications in northern France before the invasion is now a matter of history."<sup>26</sup>

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<sup>24</sup>What Is Tactical Air Power, Air Force Magazine, March 1951, p. 25.

<sup>25</sup>Craven, pp. 225-226.

<sup>26</sup>Slessor, p. 577.



## CHAPTER II

### PREWAR KOREAN TRANSPORTATION SYSTEMS AND PERTINENT GEOGRAPHIC AND CLIMATIC CONSIDERATIONS

Logistics has been defined in military terms as the art of moving supplies and military forces.<sup>1</sup> A logical continuation of this definition must be that these supplies and forces must be at the proper place at the proper time to be effectively utilized to wage war. It is not sufficient just to provide the means of movement--this movement must be accomplished during an acceptable time frame.

The whole concept of logistics has been rapidly changing since World War II. Rapid mobility of forces and readily available supplies and equipment for these forces is now where the emphasis must lie. The need for the deployment of men and their equipment is now required in a matter of hour and days rather than weeks or months.<sup>2</sup> The necessity for one combatant to deprive the other of his mobility cannot be overemphasized. Interdiction is a campaign of counter logistics--a means of depriving an

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<sup>1</sup>E. W. Miller, et al., Global Geography, (New York: Thomas E. Crowell Co., 1957), p. 429.

<sup>2</sup>Ibid.

enemy of his necessary mobility. Logically, then, any study of an interdiction campaign must include at least a brief consideration of the transportation means available to him.

The purpose of this chapter is twofold. First, we shall briefly examine geographic and climatic conditions which have limited the development of the Korean transportation network and finally we shall study the transportation system that existed prior to the Korean War.

#### GEOGRAPHIC CONSIDERATIONS

Every troop or supply movement of the Korean War, or, in fact, any war, demonstrates the basic importance of geographic logistical patterns. Any serious consideration of the problems involving the supply of or movement of military forces to or within a theater of war must consider the dominant role that geographic factors play upon this movement.<sup>3</sup>

The Taehan Minguk, officially designated as the Republic of Korea, and long known as Chosan--"The Land of the Morning Calm,"<sup>4</sup> is best described by its name, which, when poetically translated means "Land of High Mountains

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<sup>3</sup>Ibid., pp. 429-430.

<sup>4</sup>Yi Chiho, et al., Korea, Its Land, People and Culture of All Ages, (Seoul: Hakwonsa, Ltd., 1960), p. 1.

and Sparkling Streams."<sup>5</sup>

A narrow peninsula 525 miles long and varying from 125 to 200 miles wide, Korea is a land of extraordinary variety and contrast. On one hand there are high rugged mountains with fast flowing streams rushing their waters through forbidding looking and often impassible gorges; and on the other, fertile plains with green fields and rice paddies.<sup>6</sup> Approximately 80 per cent of the land falls in the first category and only 20 per cent in the latter.<sup>7</sup>

"The mountains of Korea can be said to have two general trends: One across the northern boundary of the peninsula and isolating its Asiatic hinterland except along its maritime margins, and the other along a north-south axis which splits the peninsula into an eastern and western portion. This latter ridge is closer to the east than to the west. The only significant break in this T-formation of mountains is that referred to as the Seoul-Wonsan Corridor, a depression running roughly north-south from the port of Wonsan on the sea of Japan to Seoul on the western plains."<sup>8</sup>

These mountains are of relatively low altitude in comparison with other Asiatic mountain ranges. Only a very few are over 8000 feet high and most of them are well below

<sup>5</sup>Department of Mines and Technical Surveys, Geological Branch, Korea, A Geographical Appreciation (Ottawa: 1951), p. 5. (Hereafter referred to as Canadian Mines.)

<sup>6</sup>V.T. Zaichikov, Geography of Korea (New York: Institute of Public Relations, 1952), p. 12.

<sup>7</sup>Yi Chiho, p. 3.

<sup>8</sup>Canadian Mines, p. 2.

this. However, even the lower mountains, because of their proximity to the absolute erosion base, are greatly cut up by river valleys which are characterized by deep defiles and canyons with steep and abrupt slopes. "In consequence, and as a rule, these mountains are not easily accessible, and their utilization economically, especially transportation-wise, demands large financial expenditures."<sup>9</sup> These funds have not been made available.

Obviously then, the mountain ranges and the streams flowing down from these ranges are the most dominant geographic feature of Korea. The extensive range of mountains which splits the peninsula also separates the rail networks of Korea into two separate units--one in the east coast and one on the west coast. Only two rail lines cross the interior to connect these networks. Many areas of the mountain regions are unsuitable for anything but footpath or oxcart traffic--a definite limitation upon the development of a proper and effective transportation system.

The lowland areas are located along each coast and on a few highland plains. The largest lowland area is along the western coast on the Yellow Sea. These lowlands, mostly river delta areas, are subject to great floods caused by the spring swelling of rivers and by the extreme tides.<sup>10</sup> The

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<sup>9</sup>Zaichikov, p. 14.

<sup>10</sup>Zaichikov, pp. 19-20.

principal road and rail networks are located in these areas. This constant flooding or threat of flooding has greatly hindered road and rail development.

The climate has been another factor in retarding the development of a proper transportation system in Korea. Although geographically a peninsula, the climate of Korea is, to a large degree, continental in nature. It varies from bitter cold winters to hot humid summers.<sup>11</sup> These drastic variations exist not only during the different seasons of the year, but also vary by geographic region. January temperatures will range from a -5 degrees in the northern mountainous regions to a mild 40 degrees in the south.<sup>12</sup>

These temperature variations are not in themselves an overriding factor. However, "the meteorological forces producing these drastic variations are bound up with those causing average rainfall in north to be 60 inches and the south, 20 inches."<sup>13</sup> This results in a lengthy wet season during the summer which transforms small streams into impassible and unpredictable torrential washes.<sup>14</sup> Washed

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<sup>11</sup>Ibid.

<sup>12</sup>"Korea," Encyclopedia International, Vol. X.

<sup>13</sup>Ibid.

<sup>14</sup>Lt. Gen. Edward Almond, Notes to Accompany an Address on United Nations Military Operations in Korea, Unpublished. p. 5. (Delivered to the students and faculty of the Naval War College, October 17, 1952.)

out road and rail beds, erosion and the loss of or damage to bridges due to flooding and river bed changes have greatly limited the areas where transportation facilities can be maintained.

#### ROAD TRANSPORTATION

Prior to 1950, the road and highway network of Korea was extensive in coverage but completely inadequate by western standards.<sup>15</sup> Hard surface, all-weather roads were nonexistent. A twenty mile asphalt highway from Seoul to Inchon was built in 1946, and at the outbreak of the war in Korea, this was still the only one available.<sup>16</sup> The remaining roads, either rough gravel or dirt, were in a poor state of repair. Generally this road network paralleled the rail net and was used primarily as feeder lines to the rail centers.<sup>17</sup> "All the areas are, more or less, difficult to traverse so that vehicle employment is habitually difficult and frequently impossible."<sup>18</sup>

Another factor which played a large part in limiting roadway development was the acute shortage of vehicles.

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<sup>15</sup>M.W. Cagle and F.A. Manson, The Sea War in Korea, (Annapolis: U.S. Naval Institute, 1957), p. 232.

<sup>16</sup>"Korea," Encyclopedia Britannica, Vol. XIII.

<sup>17</sup>Cagle, p. 231.

<sup>18</sup>Almond, p. 2.

Only slightly more than 16,000 cars, trucks and buses were operational in South Korea in June 1950. The big problem here is the lack of petroleum products. Very little petroleum products are produced in Korea so the people are completely dependent on import of these vital products. The importing of a sufficient amount of petroleum would have resulted in a complete foreign exchange imbalance.<sup>19</sup>

Mr. R.C.W. Thomas sums up the road transportation system when he says:

The ineffectiveness of the roadway system in the country is largely due to poor surfacing, if any, and lack of proper maintenance. In addition, roads were built with many one-way sectors, numerous low limit and narrow bridges, steep gradients and sharp curves over mountainous areas. Also many of the roads are affected by flooding and snow during the winter and rainy season.<sup>20</sup>

#### RAILWAYS

Since the beginning of the twentieth century, railroads have been the most important and most dependable means of transportation in Korea.<sup>21</sup> As previously noted, road facilities and equipment in Korea are extremely limited at best. This limitation resulted in a concentrated effort on

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<sup>19</sup>Yi Chiho, p. 232.

<sup>20</sup>R.C.W. Thomas, The War in Korea, (Aldershot, Hampshire: Wellington Press, 1954), p. 20.

<sup>21</sup>Brittanica.

the construction of a good railway system. These efforts were rewarded and when the Korean War started, they possessed a very good railroad transportation system in comparison with the many other small Asiatic countries.

The pre-1950 railway transportation system was, for the most part, a product of the Japanese occupation of Korea. This occupation lasted from 1904 until the end of World War II in 1945. Actually the sphere of Japanese influence preceded this date. Japan had long considered Korea an integral part of her "Greater East Asia Co-prosperity Sphere." In 1892, under the guise of assisting Korean development, the Japanese Consul-General at Pusan commissioned a Japanese railway engineer, Kono Amuzu, to make a pre-estimate field survey of Korean topography for a railway to be constructed between Pusan and Seoul.<sup>22</sup> This seemingly innocent gesture of good will was the first step made by Japan to gain complete domination of the construction and management of railroads in Korea. This goal was attained by Japan following her victory in the Russo-Japanese War.<sup>23</sup>

The principal routes of Korean railways were

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<sup>22</sup>Transportation of Korea 1957, (Seoul: Ministry of Transportation, 1958), p. 17. (Hereafter referred to as Ministry of Transportation.)

<sup>23</sup>Ibid., pp. 18-19.



dictated by physiography.<sup>24</sup> The ruggedness of the terrain seriously limited its development in many areas. The main line built by the Japanese ran from Pusan, in southeastern Korea, northwest past Taegu, over a pass through the Sabaek Range to Taljon, on past Seoul, Kaesong and Sariwon and then into Pyongyang, the present capitol of North Korea. It was later extended north through Sinanju and on to Sinuiju where it connected with the Manchurian railway network, a total of 590 miles of standard-gauge, double-tracked railroad.<sup>25</sup> This route provided the basis for the network generally referred to as the "western route."

The next main effort was the extension of this route through the Wonsan-Seoul Corridor northeast to Wonsan, on to Hungnam and up the east coast to Chongjin where it branches off with one route going into northern Manchuria and the other on up the coast to where it ties in with the Russian lines into Vladivostok.<sup>26</sup> This extension northeast from Seoul is referred to as the "eastern route."

The two routes make up the skeleton of the Korean railway network. Numerous branch lines were constructed to

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<sup>24</sup>Canadian Mines, p. 57.

<sup>25</sup>Shannon McCune, Korea's Heritage, A Regional and Social Geography, Rutland, Vermont: Charles E. Tuttle Co., p. 107.

<sup>26</sup>Ibid., p. 108.

connect the interior and other remote areas with the main line.<sup>27</sup> The advent of World War II found Korea possessing one of the best rail systems in Asia. Over 3800 miles of track was operational.<sup>28</sup> Five routes connected with lines into China and one connected with a route into Russia.<sup>29</sup> The transportation route map on page 25 indicates Korean transportation means on June 1950.

This Japanese constructed pre-World War II network is just about what existed at the start of the Korean War. Although, during the war, the Japanese had allowed it to deteriorate, the overall status of the routes and equipment was relatively good. The system had received very little actual damage during the war, but the chaotic conditions in Korea following World War II resulted in very little improvement in its state of repair. A rehabilitation program had just commenced when the North Koreans invaded South Korea.<sup>30</sup>

#### SEA AND INLAND WATERWAY

Despit the obvious vast extent of the Korean coastline, very little attempt has been made by Korea to

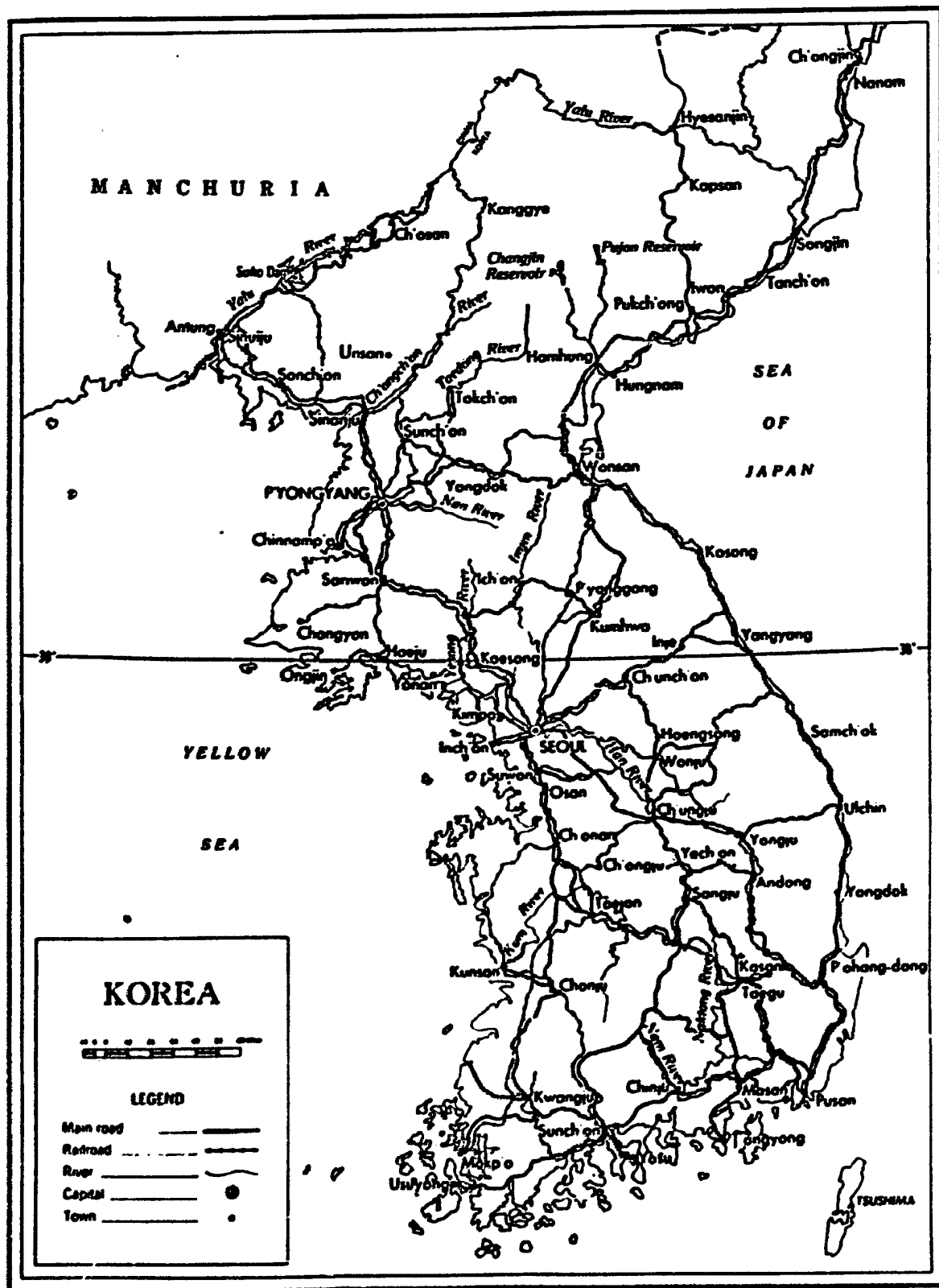
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<sup>27</sup>Norton Ginsberg, et al., The Pattern of Asia, (Englewood, New Jersey: Prentice-Hall, Inc., 1958), p. 145.

<sup>28</sup>McClune, p. 107.

<sup>29</sup>Cagle, p. 231.

<sup>30</sup>Ministry of Transportation, p. 16.



enter into the commercial shipping field. Prior to, and during the early stages of World War II, as many as 320 large steamers with a gross tonnage of up to 58,000 tons were registered under the Korean flag. These were, however, for the most part, owned by Japan and were either destroyed during the war or were changed to Japanese registration after the war.<sup>31</sup>

A large portion of the vast coastline is unsuitable for heavy ocean-going vessels and most of the gulfs and bays are far too shallow and the tides vary so widely that their use is very limited. Only the ports of Chinnampo, Haiju, Inchon, Pusan and Kunsan are accessible to large ships.<sup>32</sup> The U.S. Naval blockade during the war forbade the enemy the use of even these ports.

For this reason, it is not felt that ship transportation is a valid factor to be considered in this study. Considerable research conducted by me attested to the relative effectiveness of our naval blockade. Any use of sea or inland waterway transportation means for the delivery of logistical materials was considered as negligible. This is not to imply that many items that were water-transported to Communist China or to Russia did not end up on the Korean battlefield.

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<sup>31</sup>Canadian Mines, p. 59.

<sup>32</sup>Zaichikov, p. 27.

### CHAPTER III

#### THE NORTH KOREAN ATTACK AND THE RETREAT TO THE

#### PUSAN PERIMETER (25 JUNE - 15 SEPTEMBER 1950)

At 0400 Korean time on 25 June 1950, the Communist Army of North Korean began a general offensive along the 38th parallel "on the patently absurd pretext that the Republic of Korea had first attacked northern territory."<sup>1</sup> Six North Korean Infantry Divisions and three Constabulary Brigades with a strength of slightly more than 128,000 troops were committed all along the line with the main attack having Seoul as its immediate objective.<sup>2</sup> Ten ill equipped ROK Divisions with a strength of 80,000 troops offered only a limited defense in most areas and none at all in many.<sup>3</sup>

The Far East Command (FEC) was not prepared for the defense of South Korea for as General MacArthur later observed, "u til the president's great pronouncement to support the epochal action of the United Nations, we had no slightest responsibility for the defense of the free

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<sup>1</sup>Yi Chiho, p. 201.

<sup>2</sup>Almond, p. 9.

<sup>3</sup>Yi Chiho, p. 201.

Republic of Korea." The primary mission of FEC was the defense of an area to include Japan, the Ryukyus, the Marianas and U.S. installations in the Philippines.<sup>4</sup>

FEAF (FAR EAST AIR FORCE) was totally oriented towards this defensive posture. Tactical Air Force units in Japan were limited to two Fighter Bomber Wings, a Fighter Interceptor Wing and a Light Bombardment Wing with one squadron deactivated. One additional Fighter Bomber Wing was located at Clark Field in the Philippines and another Fighter Interceptor Wing was located at Kadena AFB, Okinawa. This totally inadequate force was all that was available to FEAF when the war started. The F80C was the only modern jet aircraft in the inventory. 423 of these were assigned to the three Fighter Bomber Wings.<sup>5</sup>

Back in Tokyo, FEAF headquarters first learned of the attack at 0945, Japanese time. General Partridge, acting commander in the absence of General Stratemeyer who was on his way back from a trip to the United States, readied his forces and awaited orders from CinCFE. The initial mission given by General MacArthur to FEAF was to aid in the evacuation of American personnel from the Seoul

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<sup>4</sup>Department of Air Force, United States Air Force Operation in the Korean Conflict (25 June - 1 November 1950) (Washington, DC: 1952), p. 1. (Hereafter referred to as USAF Report No. 71.)

<sup>5</sup>Ibid., pp. 1-2.

area and to standby on his order "to be ready to attack hostile targets in support of this evacuation."<sup>6</sup> The air evacuation commenced at dawn on the 27th and General Partridge issued a fighting order directing fighter cover for the evacuating transports and further directed that "no interference with your mission will be tolerated." YAK fighters attempted an attack on the transport aircraft and three then were shot down by American F82 aircraft. A total of seven enemy aircraft were destroyed in defense of the evacuation aircraft without the loss of a single United States aircraft to enemy air action.<sup>7</sup>

Following the UN Security Council resolution branding the North Koreans as aggressors, President Truman directed more positive action on the evening of 26 June. "The Far East Command was to offer the fullest possible support to permit ROK forces to reform their lines." This action, however, was restricted in that it permitted FEAF aircraft to conduct combat activities south of the 38th parallel only. Bad weather in both Japan and Korea limited FEAF's activity on the 27th.<sup>8</sup>

Early on the morning of 28 June, a 3rd Bombardment

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<sup>6</sup>R.F. Futrell, The United States Air Forces in Korea 1950-1953, (New York: Duell, Sloan and Pearce, 1961), pp. 8-10.

<sup>7</sup>Ibid., pp. 12-13.

<sup>8</sup>USAF Report 71, pp. 5-6.

Group strike force of twelve B26's bombed the busy railway yards at Munsan, north of Seoul, and strafed and bombed targets of opportunity over the nearby railroad and highway network. These road nets were packed with Communist tanks, trucks and troops. The results of these strikes were excellent, however, three B26's were lost to enemy ground fire. That afternoon twenty-four F80's continued the interdiction of routes between the front lines and the 38th parallel.<sup>9</sup> Enemy air opposition was quickly eliminated and close air support and interdiction missions did much to slow the rapid advance of the Communist ground forces.<sup>10</sup>

Later that day President Truman authorized FEAF to extend operations into North Korea to bomb targets "judged essential in the clearing of North Koreans from South Korea." Operations were to be conducted well clear of the frontiers to Manchuria and the Soviet Union. On 30 June the President further authorized the use of U.S. ground forces in Korea and directed that a naval blockade of North Korea be established.<sup>11</sup>

Air Superiority, the first mission of air power in a theater of war, was obtained with relative ease. The

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<sup>9</sup>Futrell, pp. 26-27.

<sup>10</sup>United States Military Academy, Operations in Korea, (West Point, 1953), p. 8. (Hereafter referred to as USMA.)

<sup>11</sup>USAF Report 71, p. 7.



North Koreans apparently had not counted on the United Nations' intervention and had assumed that the obsolete Russian planes allotted to them could easily achieve air superiority over the almost nonexistent Republic of Korea Air Force. Enemy air attacks during the opening days of hostilities were very aggressively executed and caused many casualties among the retreating ROK troops. This effectiveness was shortlived and most of the estimated 145 aircraft possessed by North Korea were out of action by the middle of August.<sup>12</sup> A state of what has been referred to as "political air superiority" had been achieved - air superiority within a particular political limitation. The political limitation being that the Communist had refused to commit any more aircraft to the air battle and the United Nations decision to limit air activity to Korean skies only. "We were not required to fight a constant all out battle for control of the air." Regardless of how obtained, this superiority allowed the Navy to operate carrier forces very close in and this greatly enhanced the overall air effort.<sup>13</sup>

Rail interdiction in Korea began on a very austere

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<sup>12</sup>Ibid., p. 34.

<sup>13</sup>G.E. Tarmion, "Political Air Superiority in the Korean Conflict," Air University Quarterly, (Winter, 1953-54), pp. 79-80.

basis. Only a sporadic designation of targets was made. Most of the bridges over the Han river had been destroyed on 29 July at the direction of General MacArthur. Thereafter the very limited air power available and the extreme gravity of the ground force situation necessitated the use of nearly every sortie, including even the B29 medium bomber, in direct support of ground forces. On 8 July, General Stratemeyer declared that the destruction of key bridges behind the enemy lines was the paramount mission of FEAF at that time. Despite this declaration, FEAF was not permitted to begin any coordinated or comprehensive programs of interdiction until 28 July, more than a month after the outbreak of hostilities.<sup>14</sup>

The first major efforts at extensive rail interdiction were conducted by the FEAF Bomber Command. All the Tactical elements of the Fifth Air Force were to continue in close support. On 7 July, General Rosie O'Donnell and his staff arrived in Tokyo and formed the FEAF Provisional Bomber Command. Bomber Command took operational command of the 19th Bombardment Group at Okinawa and within three days these forces were augmented by two more bomb groups (The 22nd and the 92nd) on temporary duty from the Strategic Air Command. The 19th was directed to continue its mission of close air

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<sup>14</sup>USAF Report 71, p. 41.

support and immediate area interdiction while the two SAC groups were released to attack interdiction targets north of the 38th parallel.<sup>15</sup>

On 13 July, only eight days after receiving warning orders for their movement to Japan, these two groups flew their first mission against the marshalling yards at Wonsan.<sup>16</sup> The first mass raid was conducted against the Ryuzan yards at Seoul on 16 July. Sixty B29's took part in the mission and the results were rated as excellent. Rail movement through Seoul was slowed to a trickle and severe damage was inflicted upon locomotive and railcar manufacturing and repair facilities. A prestrike capability of repair of up to 2500 rail vehicles per year was nearly completely destroyed.<sup>17</sup> On 17 July, six B29's destroyed two rail bridges and bombed the marshalling yards at Chekon, Ansong and Wonju.<sup>18</sup>

By 27 July the overall strategic rail interdiction plan was placed into operation. The plan's aim was "to interdict the flow of personnel and material into Korea from

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<sup>15</sup>James T. Stewart (ed.), Airpower: The Decisive Force in Korea, (Princeton: D. Van Norstrand Co., 1957), pp. 76-77.

<sup>16</sup>USAF Report 71, p. 41.

<sup>17</sup>Picture Brief, Air University Quarterly Review, Fall Edition, 1950, p. 56.

<sup>18</sup>Putrell, p. 88.

the north, within Korea itself, and into the immediate combat area." Two primary choke points were to be established on routes from the north: (1) the marshalling yards and the rail bridges at Pyongyang and (2) the Hamhung railway bridge and the marshalling yards at both Hamhung and Wonson. Interdiction of the bridges and yards at Seoul would sever rail connections with North Korea. In general, with the exception of the Seoul area, the 38th parallel would separate the Bomber Command and the Fifth Air Force areas of interdiction. Initially the Navy efforts would be confined to assisting the Fifth Air Force in close support and local interdiction.<sup>19</sup> Operating from Japan, the Fifth Air Force tactical fighters were seriously range limited. Jet fighter aircraft are extremely "short legged." They use much of their fuel during take off and climbing to altitude. The distance back to recovery bases allowed as little as 15 minutes operational time over the target area. This problem was partially eliminated in late July with the arrival in Japan of the Carrier Boxer with 145 Air Force F51 propeller driven fighters. Pilots from six jet Fighter Squadrons were checked out in F51's and two temporary airstrips built at Pohang and Taegu in Korea began operations.<sup>20</sup>

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<sup>19</sup>USAF Report 71, p. 37.

<sup>20</sup>Otto P. Weyland, "The Air Campaign in Korea," Air University Quarterly Review, (Fall, 1953), p. 7.

On 28 July - the date that the two B29 Groups were made available for the interdiction campaign - FEAF issued its first list of strategic interdiction targets. The list of forty-four targets included all main railway and roadway bridges and all the larger marshalling yards.<sup>21</sup>

Interdiction Campaign No. One was initiated on 2 August. Intelligence reports had indicated a vast accumulation of rolling stock and supplies were backed up at Seoul's marshalling yard. The 19th Group bombed this yard on 4 August and on the next day over sixty B29's from the 22nd and 92nd hit them again. Official estimates of results were that "Seoul's transportation facilities would be inoperative for a considerable period of time." Two days later, on 7 August, these two wings, joined by aircraft from the 98th Group which had just arrived from the States, smashed the vast yards in Pyongyang. This attack was followed the next day by elements from the 307th Group, the fifth and final medium group to be assigned to the Bomber Command. The results of this two-day attack were excellent. Photo reconnaissance of this target revealed near total destruction of the trains in the yard and severe damage to repair and storage areas.<sup>22</sup>

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<sup>21</sup>Futrell, p. 118.

<sup>22</sup>Ibid., pp. 121-122.

The partial destruction of the yards at Seoul and Pyongyang resulted in a large backup of rolling stock at Wonson, the second largest yard in North Korea. This yard, twenty-four tracks wide, was literally jammed with equipment when three groups hit it on 10 August. Over seventy aircraft were used in this mass attack and utter destruction was achieved.<sup>23</sup>

These attacks had destroyed most of the vast accumulation of supplies that the North Koreans had built up for the offensive. The next efforts of the Bomber Command would be directed at the key bridges named for destruction. Two weeks, 12 through 26 August, would be devoted strictly to bridge destruction. Smaller marshalling yards and follow up strikes on the major yards would be designated as backup targets if weather precluded operation against the bridges.<sup>24</sup>

These bridge targets assigned to the Bomber Command were not easy to destroy; most of them had been well constructed by the Japanese. Sturdy steel-and-concrete structures spanned the major rivers.<sup>25</sup> The bridges were numerous. An average of one bridge for each 1.2 miles of

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<sup>23</sup>Picture Brief, Air University Quarterly Review, Fall Edition, 1950, p. 50.

<sup>24</sup>Putrell, p. 122.

<sup>25</sup>Ibid.

track and one tunnel for each 5 miles.<sup>26</sup> One big advantage favored the bomber crews. Since these crews had little to fear from enemy fighters or heavy flak, destruction of these targets was primarily a bombing problem. World War II tactics used by these high altitude bombers had been a formation of six to eight aircraft flying in a V-formation and with all aircraft dropping simultaneously when the leader did -- saturation bombing. This method was very effective but it required a large total bomb tonnage per target. Bomber Command could not afford the luxury of expending either sorties or bombs in this manner. The tactic finally adopted was a bomber stream of individual aircraft flying at an altitude of about 10,000 feet from an angle of 40 degrees. Each plane dropped four bombs on each pass over the bridge. This allowed the flexibility of diverting subsequent aircraft to other targets if the bridge was rendered unusable. An average of thirteen runs of four bombs each were required to knock out the average bridge. Ordnance used in the bridge campaign were generally 500 or 1000 pound general purpose bombs using minimum intervalometer settings.<sup>27</sup>

The campaign against the rail bridges was very successful. The single aircraft attack proved to be highly

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<sup>26</sup>Cagle, p. 231.

<sup>27</sup>Futrell, p. 122.

effective. The degree of proficiency obtained in such attacks was indicated by concrete mission accomplishments. By 30 August, Bomber Command had rendered unusable all but seven of the forty-four assigned bridge targets, and on 4 September when fifty-six more were placed on the target list, twelve were destroyed within three days. The overall effectiveness of this phase of the campaign was attested to by the "Fifth Report to the United Nations Security Council by the United States Government" where it stated:

Along the highway and rail nets some 250 bridges have been rendered unusable by the dropping of at least one span each. Important marshalling yards and rail repair facilities in North Korea are from 25 to 80 per cent destroyed.<sup>28</sup>

The destruction of these bridges had not been too easily obtained from a logistical point of view. As an example of the durable nature of these bridges, the steel cantilever bridge at Seoul is given. For nearly four weeks the bridge came under daily attack by B29's using 1000 pound, 2000 pound and 4000 pound GP bombs. Three spans were finally dropped on 20 August. The total efforts towards destruction of this bridge had required eighty-six sorties

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<sup>28</sup>Department of State, Action in Korea Under Unified Command, Fifth Report to the Security Council by the United States Government, 18 September 1950, p. 4. (Hereafter this series of Reports will be cited as UNC Report, by date of submission.)



and 643 tons of bombs.<sup>29</sup>

The tactical arm of FEAF, the Fifth Air Force, had also been actively involved in the interdiction campaign. As its task under the comprehensive interdiction program which had commenced on 2 August, the Fifth Air Force was expected to interdict all lines from the 38th parallel south to the front lines. A difficult job due to the limited depth of the area. Earlier the FEAF Commander had given Fifth Air Force the primary mission of providing direct support to the ground forces and this interdiction effort was strictly second priority to the demands of the U.S. Eighth Army.<sup>30</sup>

The tactical interdiction program was keyed towards the destruction of rail bridges and cutting the rail lines leading into the battlefield. Light Bombers and fighter-bombers would first bomb the primary target, a bridge or a rail cut, and would then expend their remaining rockets and machine guns on rolling stock in the area.<sup>31</sup> These missions proved to be highly effective, however, the B26 light bombers were soon forced to eliminate these daylight low

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<sup>29</sup>"Air War in Korea II," Air University Quarterly Review, Spring, 1951, p. 65.

<sup>30</sup>Futrell, p. 123.

<sup>31</sup>Ibid., p. 124.

level armed reconnaissance sorties due to heavy losses of aircraft and crews. The slow propeller-driven aircraft was just too vulnerable for daylight low-altitude operations. They were forced to bomb from a minimum altitude of 5000 feet, generally above the range of small arms fire. This change of tactic actually proved to be a blessing in disguise. The B26 was extremely effective at this altitude.<sup>32</sup> By the middle of September, the Fifth Air Force reported that 140 rail bridges between the front line and Seoul had been rendered unusable. They had also established and maintained 47 rail cuts, nine between Seoul and Taejon and the others on tributary lines.<sup>33</sup>

Destruction of the bridges undoubtedly hampered the Communist efforts to supply its forces, but it could not stop them completely. The North Koreans would shuttle trains back and forth over very short distances of open track and use human carriers between the rail cuts. Road and rail sweeps by jet fighters were used to counter this interdiction leak. They were effective in their efforts but still a considerable amount of supplies were still getting through to the front. The interdiction area was just too shallow.<sup>34</sup>

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<sup>32</sup>USAF Report 71, p. 40.

<sup>33</sup>Futrell, p. 124.

<sup>34</sup>Ibid.

General Almond, Chief of Staff, Far East Command, in an address given at the Naval War College in 1952, stated that: "Although it was not decisive in overall effects, the heavy air attacks conducted by United Nations' aircraft on enemy railroads during the battle of the Pusan perimeter compelled the North Koreans to move only at night."<sup>35</sup> During this same period it was estimated that interdiction reduced the enemy's forward movement from a 206 ton daily average in July to a mere 21.5 tons in August.<sup>36</sup>

In addition to the previously mentioned bridge destruction and rail cuts, FEAF reported the destruction of 280 locomotives and 1314 railway cars during the period. An additional 161 locomotives and 1570 railway cars were listed as damaged.<sup>37</sup> On the face of it, it would seem that initial interdiction efforts had been successful.

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<sup>35</sup>Almond, p. 14.

<sup>36</sup>Weyland, p. 9.

<sup>37</sup>USAF Report 71, p. 45.

## CHAPTER IV

### THE INCHON INVASION AND THE UNITED NATIONS OFFENSIVE TO THE YALU (15 SEPTEMBER - 2 NOVEMBER 1950)

On 15 September, 1950, Operations Order CHROMITE was executed. This order directed that the U.S. Tenth Corps conduct an amphibious invasion at Inchon. Its mission was to seize and secure Inchon, the Kimpo Airfield, the town of Seoul, to sever all North Korean lines of communication in the area and to destroy the North Korean army south of the line Inchon-Seoul-Ulchin. This was to be a coordinated attack by all ground forces in the theater. At D 1, the U.S. Eighth Army was to attack and break out of the Pusan Perimeter and was to drive north along the Taegu-Taejon-Suwon axis to link up with the invasion force.<sup>1</sup>

The Fifth Air Force had been maintaining constant interdiction pressure in the Inchon-Seoul area since the start of the interdiction effort. Every major rail line leading into the invasion area was subjected to daily attack. To achieve tactical surprise for the amphibious assault, it was decided not to increase or decrease

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<sup>1</sup>USAF Report 71, P. 60.

activity in this area until after D-Day. Between D-10 and D-3, the Bomber Command was to conduct a major effort against all profitable marshalling yards on the main line leading into the invasion site from the north. The assault forces that were to be landed were smaller than the enemy forces that could be brought against them if a means of transportation was available to the enemy. To prevent this possible reinforcement, Bomber Command formed a triangle around the area, striking along the rail lines from Seoul to Wonsen to Pyongyang and back to Seoul. As an example of one day's activity of this armed reconnaissance by the B29's, on 10 September, they hit ten rail tunnels, two trestles, eight rail bridges, two marshalling yards and numerous rail cuts.<sup>2</sup>

On 13 September, D-2, despite typhoon conditions in Japan, marshalling yards at Anju, Kwaksan, Chongju, Sunan, Hwangju, Chaeryong, Kumchon, Namwon and Yesong were attacked. Choke points were established in each of these areas, and, to complicate repair and restoration, clusters of small delayed fuse bombs were dropped on each choke point.<sup>3</sup>

The assault on Inchon was made with relative ease.

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<sup>2</sup>USAF Report 71, pp. 63-65.

<sup>3</sup>Ibid., p. 65.

The extreme tides at Inchon had required that the assault be made in two phases. The island of Walmi-do, in the harbor and connected to Inchon by a causeway, was taken early on the morning of the 15th by a Marine Battalion while the remainder of the landing forces stayed aboard the troopships. The main assault party hit the beaches that evening and only two hours was required to completely ring the city of Inchon and to capture the assault objectives. Within 3 days the Kimpo Airport had been captured, Seoul was encircled and army troops were deployed along the banks of the Han River.<sup>4</sup>

During the first three days of the invasion, all United Nations air efforts were flown in direct support of either the Tenth Corps at Inchon or the Eighth Army in its breakout from Fusan. The North Koreans were completely routed and the Eighth Army quickly linked up with the Tenth Corps and started its advance toward the Yalu. A backlash effect of the extensive rail interdiction program was felt by our advancing armies. Eighth Army intelligence reports indicated that enemy rail lines had been "destroyed to the extent that it greatly impedes our forward movement."<sup>5</sup> Benefits of the program were also seen. The disrupted

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<sup>4</sup>T.E. Fehrenbach, This Kind of War (New York: The Macmillan Co., 1963), pp. 243-246.

<sup>5</sup>What Is Tactical Airpower? p. 38.

communication system now served to retard the withdrawal of the fleeing enemy and to prevent his withdrawal of any heavy equipment....abandoned vehicles and artillery attest to the inability of the enemy to move his equipment.<sup>6</sup>

Within ten days after the Inchon invasion and with the success of the breakthrough at the Pusan perimeter, the Joint Chiefs of Staff cancelled strategic attacks against North Korean targets. The destruction of targets of long term military value were no longer required. All air operations were to be directed at targets which had an immediate bearing on the ground tactical situation. Further, on 1 October, General MacArthur prohibited the further destruction or damage to rail facilities south of the 38th parallel. Attacks on North Korean rail lines were restricted to rail cuts.<sup>7</sup>

The whole interdiction objective changed from one of stopping the flow of supplies and troops to the south to one of doing everything possible to slow down or stop the fleeing North Koreans and to do as much damage to him as possible during his retreat. Most of the rail lines had been so badly damaged that they were not a great factor in the retreat. The rare attempt to move a train during daylight

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<sup>6</sup>UNC Report, 21 October 1950, p. 6.

<sup>7</sup>Putrell, pp. 158-159.

hours nearly always resulted in its destruction. This led the enemy to move his few remaining trains only at night after hiding them in tunnels during the day. The "buddy" system was devised to try to stop this night movement. A B29 and a B26 would team up and work the routes together. When a train was sighted the B29 would make a pass over the area dropping a long series of brilliant flares. The B26 would then come in low and use its armament to attack the train. This tactic resulted in the destruction of a train on the night of 22 September. The train must have been carrying munitions for its cars continued to explode for thirty minutes after the attack. This same team also damaged another train the same night.<sup>8</sup> Most of the other teams, however, did not have this success and the tactic was soon discarded as not being sufficiently productive. It was also decided that the old World War II flares being used were too dangerous to the aircraft to warrant their use. Thereafter each interdiction aircraft was given a mixed load of bombs and external British Mark III flares and reverted back to single ship operation.<sup>9</sup> These British flares were more reliable but were in very short supply.

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<sup>8</sup>Ibid., pp. 156-157.

<sup>9</sup>Stewart, p. 79.



The rapidity of the UN sweep through North Korea made any comprehensive interdiction efforts nearly impossible. It was also felt that this type of attack would not really hinder the Communist's ability to fight. It was estimated that he needed only 50 tons of supplies per day during his retreat. Rail bridges well up in North Korea were kept unusable to prevent any attempt at reinforcement. On 18 October the B29's were forbidden to operate south of Sinanju. This, coupled with the previously imposed restriction of avoiding the Manchuria-Siberian border by at least 50 miles, left only an operational area of less than 100 miles in depth.<sup>10</sup>

Very few pure rail interdiction sorties were flown during the remainder of this period. Some rail targets were attacked as "targets of opportunity" during armed reconnaissance missions. Bridge and rail attacks were restricted to those that were known to be used by the North Koreans. Random bridge destruction or the cutting of a rail line was, more often than not, a greater hinderance to our advance than it was to the enemy's retreat. The Bomber Command had run out of worthwhile targets. So many restrictions had been placed on their

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<sup>10</sup>USAF Report 71, p. 79.

employment that it was not economical to use them in the numbers previously used. Accordingly, on 10 October, B29 Sorties were limited to twenty-five per day and were further cut to fifteen on 22 October. The entire Command stayed down on the 27th as plans were being made for the return of two of the four TDY SAC Groups back to the States.<sup>11</sup> Everyone felt that the war was over. All that remained was a mopping up job for the Army and the Marines.

Rehabilitation of South Korea rail system had begun. On 21 October, the United States proudly reported to the UN Security Council that the railroad from Pusan to Seoul had been repaired and that over 1295 miles of railroad had been rehabilitated in South Korea. Over 245 locomotives and 4400 freight cars were back in operation.<sup>12</sup> This fine rail system and equipment were to be of great value to the Communist on the next trip south.

The effectiveness of the FEAF attacks on major North Korean marshalling yards and repair facilities from 25 June to 1 November 1950 is summarized in figure one.

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<sup>11</sup>Futrell, p. 195.

<sup>12</sup>UNC Report, 6 November 1950, p. 6.

FEAF ATTACKS ON MAJOR NORTH KOREAN MARSHALLING  
YARDS AND REPAIR FACILITIES(1)  
25 JUNE - 1 NOVEMBER 1950

Location	Target	Sorties	Bomb Tonnage(2)	Per Cent Destroyed	Importance of Target
WONSAN	Loco- motive shops	47	373	70	Second largest repair and manufactur- ing shop in Korea
	Railroad yards	53	477	70	One of three most important yards in Korea
PYONGYANG	Repair shops and yards	74	585	70	Largest repair and manufac- turing center in Korea
	Shunting yards	57	356	30	Controlled well over half of North Korean rail traffic

Figure 1.

Location	Target	Sorties	Bomb Tonnage (2)	Per cent Destroyed	Importance of Target
CHONGJIN	Rail yards and shops	119	1064	55	Largest railroad shops and yards on rail line between Manchuria and Siberia. Only rail shops for repair in Northeast Korea
RASHIN(3)	Shops and yards	11	110	Neg.	Northeast link to Vladovostock
CHINNAMPO	Yards	16	121	80	Largest yard in area. Service for large port facility
HAMHUNG	Shops and yards	72	547	70	Extensive yard for Hungnam Industrial Area

Location	Target	Sorties	Bomb Tonnage (2)	Per Cent Destroyed	Importance of Target
HAEJU	Shops and yards	13	104	70	Important repair facility serving entire Haeju Peninsula
KOWON	Shops and yards	16	102	10	Junction point between Wonsan and Hamhung
SONGJIN	Shops and yards	31	280	60	Two of five rail lines from Manchuria must pass through here
YANGDOCK	Shops and yards	10	75	85	Only line in North Korea from East to West
CHONGJU	Shops and yards	25	171	10	Most important shop in Northeast Korea

Location	Target	Sorties	Bomb Tonnage (2)	Per cent Destroyed	Importance of Target
KILCHU	Marshalling yards	18	100	50	Controls one line connecting Korea and Manchuria
SARIWON	Marshalling yards	20	81	50	Largest yard between Seoul and Pyongyang

## Notes:

(1) Data extracted from USAF Report 71, pages 87-89.

(2) Bomb tonnages to the nearest whole ton.

(3) Only one strike against Rashin. The proximity of this target to the USSR resulted in the prohibiting of future strikes against it.

## CHAPTER V

### COMMUNIST CHINA'S INTERVENTION AND THE SECOND UNITED NATIONS' RETREAT

(3 NOVEMBER 1950 - 24 JANUARY 1951)

On the ground in the last week of October 1950, the Eighth Army on the west and the Tenth Corps on the east had fanned out on a broad front of widely separated forces which were meant to pursue rather than to fight the North Koreans. The First US Corps had crossed the Chongchon River at Sinanju and was pushing northward towards Sinuiji. One ROK regiment had reached the Yalu at Chosan on 26 October. Resistance was stiffening but this caused no great alarm. It was expected that the Communist would offer stubborn resistance when they were backed up to the Yalu. On 26 October an Army patrol had captured a Chinese prisoner and within the next few days, nine more were taken prisoner. On 3 November the enemy counterattacked and the ROK II Corps was driven back from the Yalu. That day, General Walker, U.S. Eighth Army Commander, ordered the 1st Corps to fall back and to form a defense line along the Chongchon River.<sup>1</sup>

The extent of the Chinese intervention was not known

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<sup>1</sup>Futrell, p. 207.

at first. The first Chinese prisoners indicated that they had been fighting with North Korean units. General Walker issued the following statement reflecting his views on the extent of Chinese participations: "We should not assume that Chinese Communist are committed in force, after all, a lot of Mexicans live in Texas." This is in consonance with the official FECOM view at the time. A Far East Command Intelligence Estimate, dated 14 October, reflected the following:

Recent declarations by the CCF leaders, threatening to enter North Korea if American forces were to cross the 38th parallel are probably in a category of diplomatic blackmail. The decision, if any, is beyond the purview of collective intelligence; it is a decision for war, on the highest level.<sup>2</sup>

The full extent of this intervention is now history. The Tenth Report to the UN Security Council, 27 December 50, reflected that seven Chinese Armies of at least three divisions each were known to be committed and it was suspected that at least two other divisions were either committed or were ready for commitment. This meant that between 200,000 and 250,000 Chinese "Volunteers" were actually south of the Yalu.<sup>3</sup>

Five major rail bridges span the Yalu. These were the primary entry points for the Chinese Communists into

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<sup>2</sup>Fehrenback, pp. 282-284.

<sup>3</sup>UNC Report, 27 December 1950, pp. 18-19.



North Korea. All of these bridges had been well north of General MacArthur's "chop line" and had not been bombed thus far in the war. General MacArthur had insisted all along that he be given the authority to destroy these bridges. This authority was not given. After the Chinese intervention, permission was reluctantly given to allow the Air Forces to bomb the south end of the Yalu bridges. It was firmly reiterated, however, that aircraft would not in any case "violate" the Manchurian border. This authority included those bridges on the Manchurian border only. Bombing north of a line between Musan and Chongjin was still prohibited. The Siberian supply lines were allowed to conduct business as usual.<sup>4</sup>

General Stratmeyer protested that the job of destroying these bridges with such restrictions was practically impossible. Further, he stated that it would also be impossible to provide adequate fighter cover for the attacking bombers if the restriction was not lifted.<sup>5</sup> General Stratmeyer later pointed out the complete ineffectiveness of this type of bombing when he appeared before a Congressional Subcommittee in 1955. When asked if this was an effective way to destroy a bridge, he

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<sup>4</sup>Putrell, pp. 209-210.

<sup>5</sup>Ibid., pp. 210-211.

replied:

In order to hit a target on a bomb run, you have to fly a straight course and you usually try to bomb generally along the length of the bridge and not cross-ways....in order not to violate the air over Manchuria, we could not fly our bomb run over the length of the bridge and destroy it. We had to fly on a tangent....we had authority to bomb the south end of the bridge only.<sup>6</sup>

On 6 November General Stratemeyer called upon Bomber Command to destroy the six international bridges over the Yalu and ten cities that were suspected of harboring enemy troops. The six bridges were the dual bridge at Sinuiju, a highway bridge at Chongsongjin, a railway bridge at Namson-ni and a highway bridge and railway bridge at Manpojin. Due to the large number of targets and the urgent need for their immediate destruction, General Stratemeyer asked Admiral Joy's Task Force 77 to assist in the attack on the bridges.<sup>7</sup>

The aerial battle of the Yalu bridges began on 8 November with the attack on Sinuiju. Some 300 fighters had spent the early part of the day knocking out enemy air defenses with machine guns, rockets and napalm. That afternoon seventy-nine B29's dropped 630 tons of bombs on the town and the south end of the dual span railroad bridge across the Yalu. Damage estimates indicated that the town

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<sup>6</sup>Testimony of General George E. Stratemeyer in a hearing before a special Subcommittee of the Judiciary Committee, 84th Congress, 1st Session, 1955., p. 1721.

<sup>7</sup>Futrell, p. 212.

and the marshalling yards were over sixty per cent destroyed. Only minor damage was done to the bridges.<sup>8</sup>

Navy Task Force 77 was assigned the major bridges at Hyesanjin and Manopjin and were to assist in the attacks on Sinuiju. Task Force 77 had been very successful in previous attacks on the smaller bridges in the south. The bridges over the Yalu provided a much more complex problem. These Japanese constructed bridges were well made and were designed to withstand natural adversities. During a two week period, from 9 to 21 November, TF77 flew 593 sorties and dropped 232 tons of 500, 1000 and 2000 pound bombs on these targets. Hits were made and the bridges were damaged but they could not be knocked out. Direct hits often destroyed only minor supporting spans. Larger bombs would have to be used to down the major spans. The Navy Aircraft did not have the capability to carry a bomb larger than the "2000 pounder." On 29 November the Navy was directed to discontinue attacks on the bridges and to provide close support to the First Marine Division which was starting its retreat towards Hungnam.<sup>9</sup>

Following the unsuccessful raid on the 9th, the B29's returned to Sinuiju on the 13th. Nine B29s "walked"

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<sup>8</sup>Newsweek's History of Our Times (New York: Funk & Wagnalls, 1951), pp. 38-39.

<sup>9</sup>Cagle, p. 227.

1000 pound bombs across the bridge approaches and covered both bridges well out to midstream. The following day twenty-one B29's dropped 111 tons of bombs on the bridges at Manpojin. Although a good bomb pattern was observed and several direct hits were scored, the bridges were still usable. Reconnaissance aircraft indicated trains crossing over the bridge that very night. All of these international bridges came under daily attack by the Bomber Command during the rest of November.<sup>10</sup>

Bombing from an altitude of 10,000 feet and with little or no enemy opposition, the B29 crews had developed great skill and accuracy in the destruction of bridges in South Korea. Bombing the Yalu bridges presented greater problems. Intense and accurate enemy flak forced the bombers up to above 20,000 feet and enemy fighters were a constant threat. The axis of attack had to be such that would preclude any possibility of overflying Manchuria. Additionally, attacks on the bridges had to be made only under visual flight conditions. The B29 was inherently unsuited for the pinpoint accuracy required to destroy these bridges under such restrictive flight conditions.<sup>11</sup>

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<sup>10</sup>Department of Air Force, United States Air Force Operations in the Korean Conflict. (1 November 1950 - 30 June 1952) (Washington, DC: 1955), p. 23. (Hereafter referred to as USAF Report No. 72)

<sup>11</sup>Ibid., p. 22.

By the end of November the bridge battle had resulted in cutting at least four spans of the international bridges and severely damaging many of the others. It was increasing evident, however, that the results were not commensurate with the vast effort expended.

The Yalu was now frozen and traffic was observed crossing over the river on the ice. On 5 December the decision was made that the efforts against these bridges would be reduced and Bomber Command would renew attacks on marshalling yards and rail cuts. Plans called for the return to the bridge campaign when the ice had broken up on the rivers of North Korea.<sup>12</sup>

During this period, the Fifth Air Force light bombers and fighters were busy interdicting the bridge areas by flying armed reconnaissance of rail routes leading south to the front lines. Back in August, when General Stratemeyer became disturbed over night movement of supplies, he had directed the B26's of the 3rd Bombardment Group to begin night armed reconnaissance. The daylight vulnerability of these light bombers had seriously restricted their use in areas of known heavy flak concentrations. This wise decision gave the tactical forces a twenty-four hour capability which was just what was needed during this period. United Nations' ground forces were falling back in all areas.

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<sup>12</sup>Ibid., p. 24.

Our inability to destroy the Yalu bridges resulted in a vast amount of rail traffic behind the front lines. Jet fighters worked the routes during daylight hours and the B26's and the Marine F7F's worked them all night.<sup>13</sup>

Results of these attacks were excellent and greatly reduced the Chinese capability to mass enough forces for a major attack. Between 15 and 30 December FEAF aircraft destroyed 26 locomotives and a "large number of railcars" carrying troops and supplies.<sup>14</sup>

The full magnitude of the interdiction efforts during this period was indicated by the fact that FEAF aircraft flew 7,654 interdiction sorties in December. Interdiction Campaign No. Four was instituted on 15 December. This plan divided North Korea north of the 37th parallel into eleven zones which generally followed the main transportation routes. The plan listed 45 railway bridges and 39 marshalling yards for destruction. The U.S. Navy TF77 assumed responsibility for the three zones established in the east coast from Wonsan north to the Siberian border. This plan was so conceived that if all the rail bridges listed were kept unusable "the enemy would not be able to use any stretch of rail line longer than 30 miles in length."<sup>15</sup>

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<sup>13</sup>Ibid.

<sup>14</sup>Ibid., p. 34.

<sup>15</sup>Putrell, p. 243.

In planning his retreat, General Walker had hoped to delay as long as possible and then to fall back in successive steps to escape destruction. Four defensive lines were drawn: "Able," north of Pyongyang; "Baker," along the Imjin River and 38th parallel; "Charlie," around Seoul in a crescent-shaped bridgehead and over to Hongchon on the east coast; and, finally, "Dog," traversing Korea through Pyongtaek, Wonju and Samchock and the 37th parallel. The enemy took line "Able" before the Eighth Army could take positions on it. Line "Bravo" fell in late December. Seoul was lost in early January and even line "Dog" was penetrated with the loss of Wonju on 14 January 1951. On 15 January a line between Wonchon and Yongwae was established and held.<sup>16</sup>

As the Communist were advancing, the effect of this interdiction effort began to be felt. We forced him to move at night, over secondary roads and trails and it was soon impossible for him to maintain his general offensive. Reinforcing units required two to four months to travel from the Yalu to the front. According to interrogated POW's, they arrived at the front in no physical condition for combat. Constant harrassment of his now overextended logistic tail prevented adequate material support.<sup>17</sup>

There is little doubt that the interdiction program

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<sup>16</sup>Ibid., pp. 251-261.

<sup>17</sup>Weyland, p. 13.

was significant in halting the offensive. In the limited fighting between 30 December and 25 January, FEAF claimed destruction of 8 tanks, 26 field guns, 484 vehicles, 11 locomotives and 137 railway cars. FEAF further estimated that they killed 18,829 enemy troops. These figures on casualties were confirmed by POW interrogation which credited air attacks with inflicting 50 percent of the total enemy casualties.<sup>18</sup>

By late January the entire Fifth Air Force, with the exception of two F51 wings, was again operating from Japan. This posed the same fuel problems that we had experienced six months before during the defense of Pusan. These problems greatly limited air activity. Armament loads had to be reduced to add wing fuel tanks. Time over target was reduced to where it was hardly profitable to expend the sortie.

Meanwhile, Bomber Command continued normal strikes against troop concentrations, strategic targets, marshaling yards and rail bridges.

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<sup>18</sup>USAF Report 72, p. 47.



## CHAPTER VI

### UNITED NATIONS SPRING OFFENSIVE

(25 JANUARY - 21 APRIL 1951)

After the successful United Nations defense of a line along Wonchon and Yongwal on 15 January, it was soon evident that the Communist Army had so over extended its supply lines that it would be necessary for them to withdraw to regroup and resupply. Returning reconnaissance aircraft reported enemy troops moving northward from the front lines. General Ridgway, who replaced General Walker as Eighth Army Commander when the latter was killed in a jeep accident, did not sit passively by and wait for the enemy to regroup and renew the battle for "Dog" line. He directed that a constant pressure be maintained on the enemy forces. Limited objective attacks were made all along the front. Meeting only slight enemy resistance during these attacks, General Ridgway concluded that the enemy had withdrawn in force. At dawn on 25 January the American First and Ninth Corps launched a major offensive against the Reds.<sup>1</sup>

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<sup>1</sup>Futrell, pp. 262-263.

The withdrawal of Fifth Air Force fighters back to Japan seriously hampered efforts to maintain air superiority, especially over northwest Korea. The area north from the Changchun River at Pyongyang to the Yalu became known as "MIG Alley." MIG aircraft controlled the airspace in this area and seriously restricted bomber and fighter-bomber activities within it. Heavy fighter escort was required for them to penetrate these areas. Fighter availability often dictated the mission of Bomber Command. It was not until late in March when Sabres of the 4th Fighter Wing returned to Suwan and Taegu that a degree of air superiority was restored.<sup>2</sup>

On 29 January when it became evident that the UN offensive was meeting only limited opposition, it was directed that the majority of the air effort would be used to hinder the enemy's resupply and possible reinforcement. Despite strong objections by Vice Admiral Struble, Navy TF77 was released from its close air support mission and directed to interdict the three northeastern zones between Wonsan and the Siberian border. TF77's earlier interdiction activities had been very successful and they were well suited by both location and carrier mobility for attacks on these east coast rail routes. However, the senior naval commanders had never fully agreed on the

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<sup>2</sup>USAF Report 72, pp. 52-53.

value of a concentrated interdiction program. The Navy's point of view was that close support and immediate area interdiction was of greater value to the total effort than long range interdiction.<sup>3</sup>

Fortunately Admiral Joy, COMNAVFE, did not agree with this theory. When directing the change of mission for TF77, he said:

Rail routes on the northeast coast between Wonsan and Chongjin are of continuing value as a major route over which supplies, equipment, and troops are being transported to the immediate battle area. The enemy's known capability for quickly effecting repairs to damaged portions of this route can be seriously impaired by deliberate, methodical, total destruction of all piers, spans, approaches and embankments of each vital bridge in each critical area. The enemy cannot accomplish makeshift repairs when nothing remains upon which to make them. Naval air and naval gunfire are good weapons to accomplish this job.<sup>4</sup>

Once assigned the mission, the Navy Task Force went to work without delay. The limited rail routes in these zones made it possible to concentrate on a small number of bridges and thereby completely stop all rail traffic. Daily rail cuts were maintained. Selected bridges were rendered unusable and were kept in this status despite frantic efforts by the Communists to repair them.

The bridge at Carlson's Canyon is an excellent example of the skill and determination of the Navy pilots

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<sup>3</sup>Cagle, p. 227.

<sup>4</sup>Ibid., pp. 229-230.

and also of the determination of the Communists to keep a bridge open. This month-long bridge battle provided the source data for the book, "The Bridges of Toko-Ri." It was first located on 2 March by Navy photo-reconnaissance aircraft from the carrier Princeton. Photo interpretation revealed that it was a single tracked bridge, over 600 feet long and erected 60 feet above the canyon floor. Five huge concrete piers supported six steel spans across the canyon. There were two tunnels at each end of the bridge. This bridge was the key to the whole eastern network. Its location, south of the town of Kilchu, was a point where three lines from Manchuria joined a common line to the south.<sup>5</sup>

The day after its discovery, eight Skyraiders hit the bridge. One span was cut, another seriously damaged and two were twisted out of alignment. Another span was knocked out on 7 March. Promptly, the Communist began to repair the damage. Working mostly at night, they used interlocking wooden beams called "cribbing" to replace the two missing spans and to support the damaged ones. The askew sections were straightened out and reinforced. On 15 March when photos revealed this repair effort, the Navy hit them with Napalm. This destroyed the temporary cribbing, a third span and seriously damaged a fourth.

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<sup>5</sup>Ibid., p. 234.

Only two spans were left and they were bent and twisted out of shape. Once again the tenacious Communists started to repair the bridge. In an attempt to stop this reconstruction, on 27 March B29's sprinkled delayed action bombs in the bridge area. Despite all of this action against the bridge, on 2 April it was back in limited operation. On 3 and 4 April, TF77's entire capability was directed against the bridge. All six major spans were destroyed. The Communist finally gave up. They began the construction of a rail line that would bypass the canyon and one that would not be so vulnerable to our attack. The bridge was never used again.<sup>6</sup>

It was during this period that the term "tunnel busting" came into vogue. Many highly exaggerated claims of success were made by participating airmen. An analysis of actual results revealed it is next to impossible to collapse or even seriously damage a tunnel by bombing. Even the use of the largest conventional bombs in the inventory failed to block or even seal off the tunnel. It is true, that on a few lucky occasions, a time delay bomb was lobbed directly into the tunnel. When this happened, the results were spectacular, but the incidents of direct hits were so rare that it soon proved to be a waste of bombs and sorties.

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<sup>6</sup>Ibid., pp. 233-235.

The Navy's rail interdiction mission on the east coast had been very successful. Near complete interdiction was achieved. However, two events occurred in April that necessitated the temporary cessation of this activity. First, Communist China's threatened invasion of Formosa forced us to send the fleet to the China Sea; Second, upon the fleet's return to Korean waters, the Communist Spring Offensive required that the entire Navy effort be used for close support. This lapse in the interdiction campaign once again gave the Communist time to catch up. Restoration of these lines was nearly completed before a concentrated air operation was placed against them again.<sup>7</sup>

FEAF transportation attacks had prevented the Communists from using the rail routes in northwestern and central Korea. When Navy TF77's mission was changed to close support during the early part of January, the Communists were quick to take advantage of these rail routes now open to them in eastern Korea. Air reconnaissance crews counted more than 500 boxcars in east-coast marshalling yards, principally at Kilchu and Chongjin. Heavy troop movements were noted from Hoeryong to Chongjin to Hamhung and to Wonsan. Seeking to sever these east-coast lines, the 307th Bombardment Group bombed and destroyed nine spans on railway bridges at Chuuronjang, Hongwon and Tauchon on 1 February.<sup>8</sup> During the

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<sup>7</sup>Ibid., p. 236.

<sup>8</sup>Ibid., p. 287.

first week of February all efforts were directed against the east-coast routes.

On 6 February, when Navy TF77 was again given the mission of interdicting the eastern routes, General MacArthur directed that both Fifth Air Force and Bomber Command were to concentrate on the vital northwestern area. FEAF ordered Bomber Command to attack bridges and to establish choke points; then Fifth Air Force would attack the rolling stock that would be backed up behind these points. On 7 February B29's damaged bridges between Konggye and Changjin and destroyed a bridge near Cho-ri. On 8 and 9 February, operating on a 24 hour basis, Superforts attacked key bridges at Toksil-li, Komusan and Chuuronjang while Fifth Air Force B26's, F51's and F80's damaged seven bridges and attacked rolling stock throughout the area. Further south, at Hamhung, B26's hit boxcars that were backed up in the marshalling yard.<sup>9</sup>

Bomber Command and Fifth Air Force interdiction efforts during the remainder of February were generally limited to armed reconnaissance. Fighter escort aircraft, operating from Japan, still could not support missions north of the 39th parallel. Daylight raids by the B29's without proper fighter cover invariably resulted in severe damage and numerous losses to the medium bombers.

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<sup>9</sup>Ibid.

This armed reconnaissance was highly lucrative. The ground fighting had established and maintained constant pressure on the Communist. In desperation they attempted to move reinforcements and supplies toward the front without their usual caution. Rail traffic was practically nonexistent. Any efforts to move by trains south of the 39th parallel invariably resulted in destruction or heavy damage to the train. When the enemy abandoned rail travel south of Pyongyang, Fifth Air Force concentrated on trucks and road cuts. 9181 vehicles were destroyed in January and 7184 during February.<sup>10</sup> Bomber Command continued to attack bridges and rail yards south of Pyongyang and, on selected occasions, when escort fighters were available, they hit at key bridge targets within MIG Alley.

As the UN ground forces advanced towards Seoul, more and more fighter strips were uncovered. Army Engineers and local labor worked night and day to restore these strips to where they could handle jet fighters. By the time Seoul was retaken on 14 March, many of our fighter units were back to operating out of Korean bases. Now that fighter cover was available, the B29's went back to bombing the deep strategic interdiction targets.<sup>11</sup> On 23 March, while 45 Sabres fought the MIG's at the Yalu, 22 B29's returned to MIG Alley to destroy the rail bridges at Kogunyon, Kwaksan

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<sup>10</sup>USAF Report 72, p. 54.

<sup>11</sup>Putrell, pp. 271-272.



and Chongju, thus cutting the Sinuiju-Sinanju railway in three places. Next day the two bridges at Manpojin and the single bridges at Huichon, Kunu-ri and Sukchon were damaged. Numerous small strikes of four to eight B29's hit other small yards and bridges during the last week of March.<sup>12</sup>

Late in March reconnaissance aircraft had reported that the ice on the Yalu was breaking up. The second campaign against the international bridges began on 30 March when the 19th, 98th, and the 307th Groups--each with 12 B29's--bombed the bridges at Chongsongjin, Manpojin, and Namson-ni. Little enemy air opposition was encountered and at least one span of each of these bridges was knocked out. The most important of the Yalu bridges, the dual tracked bridge between Sinuiju and Antung, was not hit at this time due to the heavy concentration of MIGs based at Antung. Cloudy weather stopped the attacks on the international bridges during the first week in April. Aircraft were diverted to secondary targets in the south.<sup>13</sup>

During the last week of March the 27th Fighter-Escort Wing had been assigned the primary duty of flying escort for the B29's attack on the Yalu. On 7 April, forty-eight F84's were launched out of Itazuke, Japan, to

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<sup>12</sup>Ibid., p. 292.

<sup>13</sup>Ibid., p. 273.

fly escort for thirty-six Superforts scheduled to bomb both the bridges at Sinuiju and the highway bridge recently completed at Viju, 20 miles east of Sinuiju. Of the 30 MIGs launched to attack the B29 formations, only one got through the fighter screen. This one MIG did, however, destroy a B29 over the target.<sup>14</sup> Bomb patterns on both targets were good and the bridge at Viju was destroyed but photo reconnaissance pictures indicated that the massive bridge at Sinuiju remained standing.<sup>15</sup> One final effort against this bridge was made on 12 April. Forty-eight Superforts were sent to bomb the bridge with 2000 pound bombs. Despite heavy aerial opposition, many hits were observed but the bridge was only further damaged. Eighty-four MIGs attacked the formations as they turned over the IP. In the air battle that followed three B29's were lost and seven were badly damaged. The MIGs did not escape entirely unscathed: B29 gunners claimed destruction of ten MIGs. These losses were in addition to the eight destroyed by the fighter escorts.<sup>16</sup>

The loss of three B29's was a prohibitive loss and further strikes against Sinuiju by Bomber Command would be held in abeyance until some way could be found to give them

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<sup>14</sup>Ibid., pp. 273-274.

<sup>15</sup>Ibid., 293.

<sup>16</sup>Stewart, p. 84.

the required protection.<sup>17</sup>

With the notable exception of this bridge at Sinuiju which refused to fall, the B29's severed most of the key bridge connections into Manchuria. Enemy fighters operation from Antung Air Field, a target we were not permitted to destroy, were just too fast and maneuverable for the B29's. Even with adequate fighter cover it would have been impossible to provide fighter depth protection without violating the Manchurian border. The bitterness of this enemy air opposition attests to the value they placed on their Sinuiju bridges.

By the end of April FEAF's interdiction box score stood at a respectable total of forty-eight of sixty assigned bridges unusable and twenty-seven of thirty-nine listed marshalling yards out of action. The cost had been heavy. Eight B29's were lost in a 30 day period and so many others had been so badly damaged that Bomber Command was down to only 75 operational ready aircraft. Bomber Command sorties were reduced to 18 per day. Target priorities were to be, in order of priority, airfields, supply and communication centers and, finally, interdiction targets. They were also directed to remain well clear of MIG Alley.<sup>18</sup>

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<sup>17</sup>Putrell, p. 274.

<sup>18</sup>Ibid., p. 294.

## CHAPTER VII

### COMMUNIST SPRING COUNTEROFFENSIVE

(22 APRIL - 8 JULY 1951)

Early in April the Eighth Army continued to press northward towards Pyongyang. The advance was going well but they were encountering stiffening enemy resistance. As the UN troops advanced toward the enemy assembly and supply area bounded by Chorwon-Kumhwa-Pyongyang, it was apparent to General Van Fleet that the enemy was massing for a counteroffensive. The rapidity of the UN advance had placed great strain on its over-extended supply lines. In the event of an enemy counterattack, General Van Fleet's plan called for coordinated withdrawals, maintaining contact with the enemy at all times, and inflicting maximum losses on him by using superior artillery and airpower. When the offensive had been stopped, or slowed, the Eighth Army would then counterattack.<sup>1</sup>

It was anticipated by UN forces that the Communist attack would come some time between 20 April and 1 May. At 2000 hours on 22 April the enemy launched his attack

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<sup>1</sup>USAF Report 72, p. 61.

with an estimated 337,000 Chinese troops. The main attack was in the West, a double envelopment of the U.S. First and Ninth Corps and obviously had as its objective the recapture of Seoul and the cutting of the transpeninsular Seoul-Kansong highway.<sup>2</sup>

On 29 April, after only seven days of advancing, the Communist were stopped short of Seoul and north of the Han River. Stopped in their attack on the west, the Communist began sideslipping their divisions toward the east-central and eastern front. It was planned that the second phase of the attack was to be continued from there. These efforts were broken up by a series of penetrations into the enemy rear areas by tank-infantry task forces. When the Communist would release pressure against the front and start eastward movement, these task forces would smash through into the enemy's rear and destroy his supplies and inflict heavy casualties on the disorganized enemy.<sup>3</sup>

By 1 May the enemy had massed twenty-one divisions in central Korea and they began the second phase of their offensive. Twin attacks were made on the east-central front, the main attack being made in the Naepyong-Inji-Nadong area. Although the Communist did succeed in

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<sup>2</sup>Putrell, p. 336.

<sup>3</sup>Ibid., p. 338.

advancing about thirty miles, their efforts to outflank Seoul were not successful. They did not possess an ability to exploit their gains. In fact, they had been maneuvered into a position that set them up for a major counterattack. The counterattack, operation PILEDRIVER, resulted in a virtual rout of the enemy, and by 10 June, the Eighth Army was occupying positions generally along the 38th parallel.<sup>4</sup> These positions would be approximately those held by both sides throughout the remainder of the war.

Air power had played a very vital part in neutralizing the enemy attacks. Over 50 per cent of the entire FEAF effort was directed at close support targets. Thousands of enemy casualties resulted from these attacks. In listing some outstanding aspects of the war, General Almond stated:

Interdiction and neutralization of enemy concentrations greatly aided in the defeat of Communist armies during their mass attacks between 16 and 23 May 1951.<sup>5</sup>

The reduction of Bomber Command sorties and the assignment of close support roles to both the Fifth Air Force and Task Force 77 resulted in a vast reduction in interdiction activities during May 1951. FEAF Interdiction

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<sup>4</sup>USAF Report 72, pp. 62-63.

<sup>5</sup>Almond, p. 57.

Campaign Number Four was modified with a change in emphasis and tactic for Bomber Command. The Air Force Chief of Staff, General Hoyt S. Vandenberg, directed that B29 sorties be reduced to a maximum of twelve sorties per day. He further directed that these sorties be flown in a mass formation and that they be provided adequate fighter cover to prevent the continuation of what he considered an unacceptable loss rate. The use of small three or four ship formations made the B29 too vulnerable to attack by MIG Interceptors.<sup>6</sup>

Mass formations greatly restricted target selection. The previous method of dividing the B29's into two, three or four ship formations gave them the flexibility of attacking four or five bridges or small marshalling yards in a given area. This would generally stop the flow of traffic through that particular area for a few days at least. Use of these large formations dictated that the B29's be used against the larger marshalling yards and bridge complexes only. Large daylight formations were just not feasible against the targets available.

The restriction on mass formations applied to daylight sorties only. Bomber Command had been experimenting with various bombing systems that would provide the required pinpoint accuracy during night and/or overcast conditions.

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<sup>6</sup>Putrell, p. 295.

SHORAN (Short-Range Navigation) proved to be the answer. SHORAN is "A system of electronic triangulation wherein pairs of ground stations are interrogated automatically and aircraft positions are computed constantly along arcs."<sup>7</sup>

The success of SHORAN led to an increasing trend toward night operations. Any target that could be precisely located could be bombed at night with very accurate results. The MIG's did not operate at night and the limited night interception capability that the enemy did possess was not effective. These attacks on bridges using SHORAN resulted in sixty-six cuts in May and twenty-nine more in June.<sup>8</sup> Lucrative marshalling yards were regularly attacked in both daytime and nighttime operations throughout May and June. These attacks were scheduled after a series of bridge or rail cuts in a particular area had backed up the railroad equipment at nearby yards. Destruction of the locomotives and cars in these yards was the primary purpose of the strikes. Repair and construction facilities in these yards had been destroyed early in the war and the Communists had given up attempts to repair or maintain them.

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<sup>7</sup>Stewart, p. 87.

<sup>8</sup>Richard G. Hubler, The Strategic Air Command, (New York: Duell, Sloan and Pearce, 1958), pp. 105-106.



During May 1951 when Fifth Air Force was assigned the primary mission of close support, only about thirty per cent of each day's sorties were directed against interdiction targets. The two B26 groups flew armed reconnaissance of the rail routes at night and the fighter-bombers took over during daylight hours. These daylight operations were not productive from a railroad interdiction point of view. Most of their efforts were against trucks and personnel movements. The night flying B26 crews had better luck. On clear nights sightings of three to five trains and as many as 2000 other vehicles were not at all unusual. Crews noted Communist trains running from tunnel to tunnel over incredibly short stretches of usable track. Stopping this flow of supplies with the obsolete B26 was not easy. The night intruder crews employed a variety of tactics depending on the phase of the moon, visibility conditions, area of operations and the armament configuration of the aircraft.<sup>9</sup>

The most widely used tactic was to form a team of one B26 and a flare laden C47. Upon sighting a train the C47 would drop a string of flares and the B26 would go low level to attack the target with rockets, bombs and machine guns. This worked well in many cases but the slow flying C47's were not permitted to go north of 39 degrees and

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<sup>9</sup>Futrell, pp. 298-300.

30 minutes north latitude. During April and May 1951, Fifth Air Force claimed the destruction of fifty-four locomotives and 1194 rail cars. "The B26 night-intruder crews lacked much that they needed, but they were evidently causing the Communist plenty of trouble."<sup>10</sup>

The Navy Fleet returned to Korean waters on 1 May 1951 and they were immediately assigned the mission of close air support for Eighth Army forces on the eastern coast. A few days later the First Phase of the Communist offensive had slowed down and a portion of Task Force 77's air effort was put back to work interdicting the rail routes between Wonsan and Chongjin. During the first three weeks of May aircraft of TF77 destroyed at least one span on thirty-one different bridges. The most spectacular of these attacks was made on 11 May. Fifth Air Force had requested a special strike on four bridges located on the west coast in the Anju area. Thirty-two Skyraiders, each carrying two 2000 pound bombs, and thirty-two Corsairs each carrying eight 100 pound bombs attacked these four bridges. Three of the bridges were destroyed, and the other was severely damaged. On 19 May the second phase of the Communist offensive began and all naval air effort was directed back to close support missions.<sup>11</sup>

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<sup>10</sup>Ibid., pp. 299-303.

<sup>11</sup>Cagle, pp. 237-238.

Towards the end of May 1951, Fifth Air Force was given the primary responsibility for interdiction of the enemy's lines of communication. Bomber Command rail interdiction efforts were to be confined to strikes on the larger marshalling yards.\* Upon receipt of the order charging him with this responsibility, General Timberlake, Fifth Air Force Commander, ordered the execution of an operation he referred to as STRANGLE. This term was not new to an interdiction program. It was previously used to describe the highly successful interdiction activities during the Italian Campaign of World War II. General Timberlake added that he felt the use of this term might glamorize the task for those ground officers who were not completely sold on interdiction.<sup>12</sup>

Initiated on 31 May 1951 the goal of STRANGLE was to paralyze enemy transportation means between the railheads north of the 39th parallel and the front lines. A sixty mile wide zone between 38° 15'N and 39° 15'N was to be given primary emphasis. An interdiction tactic generally referred to as "belt interdiction." This zone

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\*United Nations' leaders were now convinced that a quick win was not possible. Most of the future B29 sorties were to be directed against strategic targets which had previously been spared in hopes of not having to destroy the economy of Korea.

<sup>12</sup>Futrell, p. 296.

was further divided into eight primary route zones. Fifth Air Force was assigned the three routes on the west coast, Navy Task Force 77 took the two in central Korea and the eastern three routes were assigned to the 1st Marine Wing.<sup>13</sup>

STRANGLE is important to a study of rail interdiction because it marks a shift in primary emphasis from rail to road routes. It is true that the campaign was designed to cut all means of transportation but the geographic restrictions placed on this operation very seriously hampered the overall rail interdiction program. The primary enemy means of transportation in this narrow zone was trucks. Major railheads and bridges were well north of this restricted zone of operations.

STRANGLE plans called for the systematical application of all means of interdiction: bridge attacks, marshalling yard strikes, cratered road and rail beds and attacks on moving transportation targets. Attacks went much the same in all three sectors. Armed reconnaissance aircraft scouted out sections of roads and railways where repairs or bypasses would be difficult and postholed them with 500 pound bombs. These "choke points" were then scattered with M-83 butterfly bombs armed with delayed fuses. Traffic congestion caused by these rail cuts were

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<sup>13</sup>Cagle, pp. 241-242.

then subjected to attack and destruction. Appropriately-timed attacks by fighter-bombers were used to keep the small local rail bridges unusable.<sup>14</sup>

The failure of the Communist offensive and the United Nation's counteroffensive north to the 38th parallel marked the end of the first year of the war. Ground positions held at this time would be generally those held at the end of the war--two full years later.

The results of a year's rail interdiction activities were very impressive. Every major marshalling yard in North Korea with the exception of Rashin, located on the far northeastern coast of Korea only seventeen miles from Soviet border, had been destroyed or heavily damaged. The Sinuiju-Antung railroad bridge was unique in its invulnerability to attack. All other bridges were either destroyed or were periodically bombed to keep them in such a damaged condition that a large logistic and personnel effort was required to keep them open for even limited use. Thousands of rail cuts were made. Enemy rail equipment losses included 893 locomotives and 14,200 railway cars destroyed or damaged.<sup>15</sup>

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<sup>14</sup>Futrell, pp. 296-297.

<sup>15</sup>USAF Report 72, p. 68.

## CHAPTER VIII

### ARMISTICE TALKS MARK A NEW PHASE IN THE WAR

(9 JULY 1951 - 27 JULY 1953)

At Peking and Moscow the leaders of international Communism must have at last recognized that victory for them in Korea was not to be had. In a radio address delivered in New York City on 23 May 1951, Soviet Russia's delegate to the United Nations, Jacob A. Malik, suggested that the time was ripe for a negotiated settlement of the Korean War. On 25 June 1951, General Ridgway, in marking the first anniversary of the war, broadcast a message to the Chinese people. In this message he stated that he could not understand why the Chinese leaders continued to sacrifice men when they knew that they were not going to be able to keep their boast of driving the United Nations' forces into the sea. In another broadcast on 30 June, General Ridgway proposed that a cease-fire meeting be held aboard a designated hospital ship in Wonsan Harbor. On 1 July the Communist answered that they "had been authorized to suspend military activities and to hold peace negotiations." They suggested that the

Korean town of Kaesong should be the place for the conferences. Vice Admiral C. Turner Joy was named the chief United Nations' delegate to the truce-talks which began at Kaesong on 10 July 1951.<sup>1</sup> These meetings marked the beginning of a new and unfamiliar type of war in Korea.

During May and June of 1951, despite the possibility that hostilities might soon be ending in Korea, FEAF planners had began construction of some semipermanent airfield facilities in South Korea. 9,000-foot runways were to be built at Taegu, Kunsan and Sowan airfields. Plans were made for the permanent deployment of Fifth Air Force units to Korea. Fifth Air Force Headquarters moved from Taegu to Seoul on 14 June. By the end of August 1951 all tactical units were operating from Korean bases.<sup>2</sup>

Fifth Air Force, the tactical arm of FEAF, was finally in position in Korea. For the first time since the outbreak of hostilities, FEAF was properly positioned to fight at full effectiveness. Bomber Command, although reduced from five to three groups due to the rotation of two groups back to SAC, was at full strength in aircraft and crews.

It is my intent to approach the study of the final period of rail interdiction from a "type of interdiction"

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<sup>1</sup>Futrell, pp. 341-346.

<sup>2</sup>Ibid., pp. 363-367.

point of view as opposed to any attempt at a chronological arrangement of missions or sorties. During this relatively static phase of the ground war, most air operations settled down into generally predictable and prescribed patterns. Routine day to day operations and the basic missions assigned each type of unit actually varied very little. Aircraft availability and crew strengths remained relatively constant. The most obvious variable of the entire operation was the constant changes in the areas of interdiction emphasis and in the various employment methods used to accomplish the mission. Each major change in emphasis will be outlined and an attempt will be made to explain the reasoning behind each change.

At this time it is appropriate to establish a basic pattern for the employment of various categories of aircraft in their rail interdiction roles. Generally, three basic types of aircraft were to be employed in an interdiction capacity during the remainder of the war--fighter-bombers, light bombers, and medium bombers.

The fighter-bombers, mostly Air Force F84's with a few F51's and F86A's, concentrated on attacking the rolling railway equipment; bombing the smaller rail bridges and marshalling yards; and, finally, on making rail cuts. Most of these sorties were flown during daylight hours.



Navy Corsairs and Skyraiders also generally fall into this category. They were employed in the same manner as the F84's, F51's, and F86A's.

The slow speeds of the propeller driven B26 light bomber and B29 medium bomber and their lack of maneuverability made them very vulnerable to jet fighter attacks. This necessitated that they switch to night operations. The B29's concentrated on the strategic interdiction targets. Nightly strikes were made against rail bridges, marshalling yards and supply storage areas. The B26's flew night armed reconnaissance of rail routes attacking any "targets of opportunity" and making rail and bridge cuts. Both the B29's and the B26's flew occasional daylight formation flights against rail bridges. These daylight sorties were flown with heavy fighter support and stayed well clear of areas patrolled by the MIG's.

By June 1951 the Chinese Communist Air Force aircraft inventory had increased to 1050; nearly half of them were modern jet fighters of the MIG-15 type.<sup>3</sup> Thwarted in their efforts to construct airfields within North Korea, the Chinese began to construct new airfields just beyond the Yalu River in the Antung complex. New fields were completed at Ta-Tung-Kou and Ta-Ku-Shan. Antung continued to be the

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<sup>3</sup>USAF Report 72, p. 107.

primary base and central controlling agency. These three airfields were able to support the operation of more than 300 MIG fighters.<sup>4</sup>

On 1 September 1951 the Communists launched a bitter and all-out campaign for air superiority.<sup>5</sup> MIG sightings during June, July and August were 389, 370 and 307 respectively. 1177 were observed during September; 2573 during October; 2326 during November and nearly 4000 in December. January, February and March of 1952 averaged nearly 3600 sightings per month. A sharp decline was noted hereafter. Only 298 sightings were recorded in June 1952.<sup>6</sup>

Although unsuccessful, this Communist attempt to gain air superiority virtually terminated rail interdiction activities in MIG Alley. The MIG pilots quickly learned to avoid the F86 Sabre aircraft and to concentrate on attacking the slower low performance fighter-bombers. When intercepted by MIG's, the fighter-bombers had little recourse but to dump their bomb loads and tip tanks and run for their lives. B29's and B26's were restricted from daylight operations in this area without massive fighter escort.<sup>7</sup>

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<sup>4</sup>Futrell, p. 371.

<sup>5</sup>Ibid., p. 373.

<sup>6</sup>USAF Report 72, p. 109.

<sup>7</sup>Futrell, pp. 373-374.

The F86's were eventually able to win this six month's battle for air superiority and they were never again seriously challenged for overall superiority. The Communist could not gain superiority but they were quite unwilling to completely surrender it. They retained the capability to launch heavy attacks against any force operating north of the Chonghongang River which runs northeast from Pyongyang. This area covers three of the five major routes into Korea from Manchuria. Daylight operations in this zone by B29's, B26's and fighter-bombers required heavy fighter escort.<sup>8</sup>

The Communists took advantage of this lull in rail interdiction activities in MIG Alley. Extensive repair of the three major lines in this area were made. Bridge bypasses were started on each major bridge even when the bridge was still usable. Repair equipment, supplies and labor forces were prepositioned along each route. It is obvious that the Communists were determined to keep these three lines open.<sup>9</sup>

Operation STRANGLE, initiated on 31 May 1951 and designed primarily to interdict a sixty mile belt across North Korea, was pronounced a failure in late August 1951.

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<sup>8</sup>Ibid., pp. 377-383.

<sup>9</sup>Ibid., pp. 411-412.

The restrictive area limitations placed on this operation had necessitated that the emphasis be placed on road transportation rather than rail. The static front line situation had greatly reduced the logistic requirements of the Communists and also as stated by Commander Cagle:

By late summer it was apparent that STRANGLE had failed. The reasons were simple. A bomb crater on an unimproved road could not stop a truck. The hole could be too quickly filled in or bypassed. Even damage of a highway bridge was no real impediment. A simple bypass could be built, or a ford across the usually summer-dry streams. In comparison to the rail networks, there was greater flexibility and greater area in the highway networks to make air attack more difficult.<sup>10</sup>

Actually it was not quite this simple. There were at least two other good reasons that undoubtedly contributed to its failure. First, the inability of FEAF to completely destroy the Yalu bridges; and second, the failure to effectively interdict the three main rail lines leading from Manchuria down through MIG Alley into the STRANGLE zone. The period of evaluation and subsequent declaration of failure coincided with the period in which rail interdiction activities in MIG Alley were seriously limited. Too many supplies were allowed to enter the narrow STRANGLE zone to expect that any appreciable portion of it would be destroyed.

On 18 August 1951, a second phase of STRANGLE was

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<sup>10</sup>Cagle, p. 243.

initiated. Emphasis was shifted from road to rail interdiction and the area of operations was extended to include all rail routes in North Korea. Reconnaissance aircraft had reported that the Communists were cannibalizing track from the less important routes to keep the main lines open. The decision was then made to concentrate all fighter-bomber sorties on making multiple rail cuts in hopes that they would finally run out of replacement tracks.<sup>11</sup>

The principle area assigned to Fifth Air Force was the double tracked line from Sariwon, just behind the front line, through Pyongyang, Sukchon and Sinanju to Sinuiju on the Yalu River. It was realized that initially the Communists could keep one track open by cannibalizing from one track to the other or by crisscrossing from damaged to undamaged stretches of track. This would still reduce his overall capability appreciably. During the first month of this program the line between Sinuiju and Sinanju was reduced to seventy per cent single track, from Sinanju to Pyongyang to ninety per cent single track and from Pyongyang to Sariwon to forty per cent single track. To keep his track open, 117 miles of track had been cannibalized between Sinuiju and Sariwon. Marshalling yards and small spur lines were torn up to provide replacement

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<sup>11</sup>USAF Report 72, p. 149.

rails.<sup>12</sup>

During October 1951, the track was being destroyed faster than the enemy could rebuild it. Rail traffic between Pyongyang and Sariwon ceased after 2 October. After 25 October the line between Sukchon and Sinanju was unserviceable. By the middle of November 1951 nearly all through rail routes to Manchuria had been severed. The enemy made herculean efforts to keep at least one route open in each area. Enemy repair efforts, when concentrated on one section of line, could nearly match us cut for cut.<sup>13</sup>

As the fighter-bombers and the B26's tore up the rail systems, Bomber Command was attacking the bridges at Pyongyang, Sinanju, Sunchon and Sonchon. Both the B29's and the B26's made nightly SHORAN drops on the swollen marshalling yards. Following the rail-cutting missions the fighter-bombers and the B26's flew armed reconnaissance enroute back to their bases. Few trains were sighted due to the vast track destruction, but they had a "field day" against enemy trucks. As the rail campaign increased in tempo more and more trucks were sighted.<sup>14</sup>

As STRANGLE progressed the Communists brought in more and more mobile automatic weapons. Each day, more

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<sup>12</sup>Ibid.

<sup>13</sup>Ibid.

<sup>14</sup>Ibid., p. 150.

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of the fighter-bomber effort had to be employed against the enemy weapon systems rather than against the tracks. In a four month period beginning 1 October, 111 aircraft were lost to enemy ground fire.<sup>15</sup> This intense and accurate enemy fire also greatly decreased bombing effectiveness. Dive bombing attacks were made rather than the low level tactic previously used. MIG-15 interceptors also harrassed the slower fighter-bombers. MIG pilots carefully avoided the F86 flights patrolling the Yalu and headed south to attack the fighter-bombers. The enemy was also beginning to demonstrate a fantastic ability to repair rail cuts. Photographic reconnaissance flown the day after a rail cut would seldom find the cut unrepaired. Major rail cuts were often repaired in as little as eight hours. Bypasses were constructed around all major bridges and their ability to repair damaged bridges was nothing short of phenomenal. On 23 December it was recognized that the enemy had "broken our railroad blockade of Pyongyang and....had won the use of all key rail arteries."<sup>16</sup>

The critics of interdiction were quick to pronounce STRANGLE a failure. The Communists had not made any large scale ground attacks during this period but it

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<sup>15</sup>USMA, p. 46.

<sup>16</sup>USAF Report 72, pp. 150-151.

would be difficult to say if this was by design or whether the interdiction program had dissuaded him. One thing is certain, the interdiction campaign had not prevented the enemy from adequately supplying his front-line forces and allowing them to maintain a strong static defense; nor had it prevented his movement of troops.<sup>17</sup>

In answering these critics, General Vandenberg stated:

Of course, an effort like operation STRANGLE will not stop the enemy dead in his tracks. As long as he is willing to pay the price in transport vehicles and equipment destroyed, he may be able to maintain his armies in some degree of operational effectiveness on the front lines....<sup>18</sup>

General Vandenberg also pointed out that while we did lose 111 aircraft during STRANGLE, there was a positive side of the picture too. In addition to the untold thousands of personnel and the vast amount of material that had to be diverted to keep these lines open, 16,000 rail cuts had been made, 200 locomotives were destroyed and another 240 damaged, 210 bridges were destroyed and 775 damaged.<sup>19</sup>

As the tactical air forces were concentrating on rail destruction, FEAF Bomber Command was attacking the

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<sup>17</sup>Ibid., pp. 151-152.

<sup>18</sup>USMA, p. 45.

<sup>19</sup>Ibid., p. 46.



rail bridges and marshalling yards. Operating mostly at night, the effectiveness of the bridge attacks was only marginal. Night bombing of a rail bridge, perhaps only twelve feet wide and between 3000 and 5000 feet long, was a very difficult task. The limited and often unreliable map coverage of North Korea made it very difficult to precisely locate many of the bridges. This inability to pinpoint the exact location of the bridges ruled out the use of SHORAN.<sup>20</sup> Three to six ship formations were generally used against the bridges. Bombing was accomplished by either visual means using the Norden bomb-sight or by use of radar. All the aircraft in the formation released their bombs simultaneously with the lead aircraft. Some hits on the target were made on nearly every attack and scores of bridges were destroyed using this method. Wide scale use of this tactic was prohibited by the great bomb tonnage required to destroy a single bridge.<sup>21</sup>

Seeking to find some solution to the large tonnage requirements for bridge destruction, experiments were made using radio controlled bombs. Single aircraft carrying either the RAZON or the TARZON was employed against bridge

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<sup>20</sup>Stewart, p. 91.

<sup>21</sup>Futrell, pp. 295-298.

targets. The RAZON, a 1000-pound general purpose bomb, was designed with a special radio receiver in the tail which allowed the bombardier to control it after release. RAZON had been employed very effectively during the latter days of World War II but the results in Korea were only marginal. In addition to being in very short supply, these bombs had been in overseas storage since 1945 and many of them were defective. Training of crews in the use of this weapon was also very poor. The RAZON experiments were soon abandoned in favor of TARZON.<sup>22</sup>

The TARZON, a 12,000-pound bomb equipped with electronically controlled tail surfaces, also proved to be a failure. It was hoped that this large bomb could destroy a bridge with a single hit. It could and did. Two spans on the railroad bridge at Oesichondong were destroyed with a single hit in the one really successful attack using TARZON. The circular error probable (CEP) of this weapon was just too large to insure damage to a heavy rail bridge.<sup>23</sup> It was also discovered that this bomb could not be salvoed in the "safe" position. The loss of at least one B29 was attributed to this. FEAF suspended the use of TARZONS pending development of a safe-salvo feature.

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<sup>22</sup>Stewart, pp. 79-80.

<sup>23</sup>Ibid., p. 80.

Combat results of this missile were thirty bombs dropped, seven bridges destroyed or damaged, three duds and nineteen targets missed.<sup>24</sup>

Medium Bomber strikes against the major marshalling yards of North Korea were much more effective than the bridge strikes had been. By the end of 1951 all of the major yards were out of business. Restrikes against them were ordered only after photo-reconnaissance revealed that the enemy was making major efforts to restore them. Smaller, isolated two-tracked yards were constructed throughout the entire rail network. Trains were kept in rail tunnels during daylight hours and limited repair and maintenance was conducted then. All major repairs were accomplished in Manchuria.

One of the most successful marshalling yard attacks was conducted against the yards at Rashin. Located in the far northeastern corner of Korea, only seventeen miles from Soviet territory, Rashin was a warm water port and naval base with extensive marshalling yard facilities and oil storage areas. All rail traffic from Vladivostok funneled through these yards. Previously listed as a significant strategic target in July 1950, the U.S. State Department had been very reluctant to coordinate the approval to bomb

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<sup>24</sup>Futrell, pp. 294-295.

a target this close to the Russian border. Reluctant approval to bomb military targets in the city was finally given by President Truman in late July 1950. He specified that any attack was to be made under visual conditions and also, bombing was to be conducted only after positive identification of the target.<sup>25</sup>

When Bomber Command hit Rashin for the first time on 11 August 1950, FEAF had neglected to specify a visual attack. Due to weather in the target area, the B29 crews used radar. The resultant bombing patterns were completely off target and were well to the northeast of the city towards the Russian border. Needless to say this created quite a stir in the State Department. On 1 September 1950 the JCS directed that Rashin would not be attacked either by air or naval means.<sup>26</sup>

A year later, in August 1951, permission was finally granted to attack the yards. The same restrictions were again placed on the B29's and to preclude any chance of violating Russian territory, it was further directed that the bomb run be conducted on a southeast heading out to the sea. It was also directed that the formation was not to go over the Tumen River, 15 miles northeast of Rashin. This made it quite a tricky maneuver. It meant

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<sup>25</sup>USAF Report 72, p. 144.

<sup>26</sup>Ibid.

that the B29's had to pass to the west of Rashin and make an immediate right turn back onto the bomb run.<sup>27</sup>

On 25 August 1951, despite the serious restriction laid down by USAF, FEAF Bomber Command bombed Rashin with a formation of thirty-five B29's. The Communist were caught off guard and made little effort to resist the attack. 350 tons of bombs were dropped. The eighteen-track storage area, the repair shops and engine houses were completely destroyed.<sup>28</sup> 97 per cent of the bombs dropped fell into the target area. Of the 136 freight cars in the yards at the time of attack, 75 were destroyed.<sup>29</sup>

The attack on Rashin was one of the most effective single strikes of the war. It indicates the capability of the B29 to obliterate a target under ideal conditions. The attack was made during daylight hours, the weather was perfect and no enemy jet fighters were encountered. The introduction of a formation or two of MIG-15's might well have resulted in complete disaster for the slow propeller-driven B29's. This was the last mass daylight formation attack that did not meet formidable enemy air opposition.

In January 1952 FEAF implemented a new experiment

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<sup>27</sup>Cagle, p. 245.

<sup>28</sup>Stewart, p. 89.

<sup>29</sup>Cagle, p. 247.

which combined the efforts of the night flying B29's and B26's. Near the town of Wadong, located about midway on the lateral railway between Wonsan and Pyongyang, a main highway crossed the railway in a narrow defile. It was reasoned that individual night SHORAN raids by B29's and B26's could so saturate this small "chokepoint" area of only 480 x 1,650 feet that rail and road traffic through the area would be stopped. The repair of the tracks and roads would be difficult, if not impossible, because of the location of the point and due to the cratering of the target area. It was further decided that this road block would also divert much traffic to the already overcrowded west coast MSR's and the night intruder B26's could increase their truck destruction. Using the highway underpass as the aiming point, in a forty-four day period beginning on 26 January 1952, 77 B29's and 125 B26's dropped 3928 500-pound bombs into the area. Bomb damage assessment results showed that only eight rail cuts and fifteen road cuts were achieved. Despite this huge effort, the rail line was blocked for only seven days and the road for only four. The enemy had not been forced to alter either his road or his rail traffic patterns. It was concluded that "it is a fallacy to assume there is an area target for traffic interdiction. Actually the only target is the

pinpoint destruction of road and rail lines proper, bridges and rolling stock."<sup>30</sup>

At the same time the bombers were hammering the Wadong crossroads, the Fifth Air Force was conducting a study on how to improve its fighter-bombers' rail interdiction efforts. Rail cuts were being made by the fighter-bombers every day in widely scattered portions of North Korea. However, these obstructions were not maintained at night, or in bad weather, or in some cases during the day. Forced labor crews were positioned at regular intervals along the track and they soon developed an uncanny ability to quickly repair these cuts. The single rail cuts could easily be repaired by these crews with the equipment and material available. It was noted that where extensive damage was done in a small area, it often necessitated bringing in heavy rail-repair equipment. This slowed the Communists' repair efforts appreciably and overtaxed both his work forces and his available repair materials.<sup>31</sup>

After surveying these deficiencies of STRANGLE, Fifth Air Force directed that a 24-hour a day interdiction effort be conducted with a sufficient concentration of effort being expended to destroy selected stretches of the road beds of key rail lines. Daylight fighter-bomber

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<sup>30</sup>USAF Report 72, p. 152.

<sup>31</sup>Futrell, pp. 415-416.

efforts would be directed against a particular segment of track along a key route and the night flying B26's would work this same segment all night. No more than an eight hours lapse between attacks on a specific segment was permitted. Four main lines were selected for this intensive interdiction: Kunu-Ri to Huichon, Sunchon to Samdong-ni, Sinanju to Mamsidong, and Pyongyang to Sariwon to Namchonjom.<sup>32</sup>

These SATURATE attacks began in March 1952. One very important difference between this plan and previous interdiction plans was that the efforts of all the units involved would be centrally controlled through the Fifth Air Force Joint Operations Center. The JOC selected the target segments and carefully controlled all flights involved. When weather or a heavy enemy flak concentration dictated a change in targets, all aircraft were directed to the new target area. Reconnaissance photos were taken throughout the day and up-to-date target assessments were made. It was planned to use 300 fighter-bomber sorties and 600 bombs on each rail segment each day. B26's would continue the cuts at night and would also scatter small delayed-action bombs in the area.<sup>33</sup>

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<sup>32</sup>USAF Report 72, p. 153.

<sup>33</sup>Futrell, p. 417.



Severe weather in North Korea hampered the first three weeks of SATURATE. Some activity was conducted during this period but the results were inconclusive. On 25 March 307 fighter-bombers dropped 530 1000-pound bombs on a rail segment between Chongju and Sinanju. That night eight B26's covered the area with 42 500-pound bombs. The next day the fighter-bombers returned to hit them with 322 more 1000-pound bombs. This two day attack stopped all traffic on the route for five days. The attack, however, had taken the entire theater fighter-bomber effort for these two days. The target route was successfully interdicted but the other routes remained open and much of the halted traffic was merely rerouted around the rail-block. In an attempt to assist in interdicting this area, B29's destroyed spans on the rail bridges at Pyongyang, Sinanju and Sinhungdong during this period.<sup>34</sup> Fifth Air Force plans for SATURATE gave the B29's the responsibility for keeping continuously unserviceable at least one bridge on the two key lines from Kunu-ri to Huichon and from Sin lju and Sinanju.<sup>35</sup>

The theory behind SATURATE had been proven valid. It worked very well on selected key routes and it was possible to completely interdict a small area of Korea. There were just not enough aircraft available to interdict the entire

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<sup>34</sup>USAF Report 72, pp. 153-154.

<sup>35</sup>Ibid., p. 181.

rail network. Variations of this plan were used throughout the war. Two mile segments of track were selected and knocked out, but the attacks were of a lesser magnitude quantitatively than the early SATURATE efforts. The modified plan placed the air efforts over a wider area and the results, by area, were correspondingly smaller.<sup>36</sup> Employing all units, including Navy and Marine, the Fifth Air Force could have established and maintained six intensive cuts on the Communist rail lines. Several times more cuts than this would have been required to deny the enemy use of the 600 miles of railways in North Korea.<sup>37</sup>

The comprehensive railway attacks against North Korea were continued until the end of June 1952. Between 18 August 1951 and 30 June 1952 FEAF aircraft had flown 87,552 interdiction sorties in support of STRANGLE and SATURATE. Pilots claimed the destruction of 34,211 vehicles, 276 locomotives, and 3,820 rail cars while 19,000 rail cuts were made. The cost to the Air Force was 451 aircrew casualties and 330 aircraft lost.<sup>38</sup>

By mid-April 1952, after over eight months of continuous air operations against the Communist railway system, it was evident that some new application of FEAF air

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<sup>36</sup>Ibid., p. 154.

<sup>37</sup>Futrell, p. 418.

<sup>38</sup>USAF Report 72, p. 158.

power might be more productive. Despite a sustained effort by a major portion of our air forces, the enemy had been able to maintain adequate logistical support for his front-line operations. In some cases he had even been able to add to his front-line stockpiles. It was estimated that he could now sustain another major offensive for as long as two weeks or an all-out defensive of three weeks duration. These sustained air attacks against his railway system had not succeeded in placing the intolerable pressure on him which had been hoped for by interdiction planners. Interdiction had destroyed a major portion of his rail system but he had proven to be extremely apt in repairing it. "That the Communists were not being subjected to intolerable pressure by the rail attacks was best indicated by their willingness to continue obstructionist maneuvers at the armistice negotiations."<sup>39</sup>

A staff study, submitted to the FEAF Deputy for Operations on 12 April 1952, pointed out the indecisiveness of the rail interdiction program and offered answers to the question: "Can we exert more pressure on the enemy by a different application of effort?" The concept offered in answer to this question was that FEAF could best contribute to the termination of the Korean stalemate "by inflecting

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<sup>39</sup>Ibid., p. 159.

maximum pressure on the enemy by causing him permanent loss."<sup>40</sup> This report further stated that FEAF should seek to destroy such supplies, equipment, facilities and personnel as would represent a permanent loss and accumulative drain on the enemy's strength.<sup>41</sup>

Targets considered for destruction under this PRESSURE campaign should be identified according to: (1) effect of their destruction upon the enemy; (2) vulnerability to available air weapons; and (3) cost of the air effort to friendly forces. Targets which appeared potentially attractive for PRESSURE attacks using the above criteria were listed in rough priority as follows: locomotives, vehicles, supplies, buildings, rear area troops and manpower, rolling stock, fixed equipment such as radar and guns, rails and railbeds and, finally, front line troops. Unlike STRANGLE and SATURATE, pressure operations were not keyed to ground operations.<sup>42</sup>

On 12 July 1952 FEAF reiterated that the first priority of air efforts would continue to be air superiority but that other combat air efforts would accomplish "the maximum selected destruction in order that the Korean conflict is made as costly as possible to the enemy in terms of

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<sup>40</sup>Ibid.

<sup>41</sup>Ibid.

<sup>42</sup>Ibid., pp. 159-160.

equipment, supplies, facilities and personnel."<sup>43</sup>

FEAF did not intend to abandon interdiction attacks but they had so greatly reduced rail interdiction activities that by early July the effort had dwindled to almost nothing. On 28 August 1952, General Banfill, FEAF Chief of Intelligence, pointed out the direct relationship between the reduction in rail interdiction efforts and a steadily improving enemy supply situation. Hostile artillery fire had increased all along the front line and as this fire increased, United Nations' ground casualties increased. General Banfill further stated: "Although rail interdiction may not prove decisive, statistical evidence indicates that immediate resumption of the rail interdiction program is warranted."<sup>44</sup>

The FEAF Target Committee meeting on 2 September decided that "some effort" should be placed on the interdiction of hostile rail lines but further stated that these efforts would not "be to an extent where it detracts from the primary purposes of our program."<sup>45</sup>

This "some effort" proved to be very meager at best. FEAF planners had become completely disenchanted with

<sup>43</sup>Ibid., p. 160.

<sup>44</sup>Department of Air Force, United States Air Force Operations in the Korean Conflict (1 July 1952 - 27 July 1953) (Washington, DC: 1956). p. 108. (Hereafter referred to as USAF Report No. 127)

<sup>45</sup>Ibid., pp. 108-110.

rail interdiction. Rail bridges and marshalling yards were generally scheduled as secondary targets and were bombed only if the aircraft were unable to hit the primary targets. All routine efforts at interdiction were directed against truck traffic. The final all-out rail interdiction effort was the week-long battle to destroy the rail bridges between Sinanju and Yongmedong.

On 2 January 1953 it was proposed that one final maximum effort be made to block the west coast rail network by the destruction of the eleven bridge complex which straddled the Chongchon and Taeryong Rivers between Sinanju and Yongmedong. This vital bridge complex was a filter point for three of the five rail routes from Manchuria. A natural chokepoint, this area was so important to the Communists that they had constructed eleven railroad bridges across the rivers in a two-mile by four-mile area. It was directed that this be an around-the-clock operation using both Bomber Command and the fighter-bombers and light bombers of the Fifth Air Force.<sup>46</sup>

The attacks began on the night of 9 January when eighteen B29's flew through intense flak to drop 170 tons of bombs on the bridges and adjacent marshalling yards. The next day 300 fighter-bombers hit the bridges with 282

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<sup>46</sup>Stewart, pp. 141-143.

tons of bombs and shot up the searchlight and anti-aircraft gun emplacements. For the next five days and nights, the B29's and B26's bombed the area all night and the fighter-bombers took over during daylight hours. Fighter-bombers also hit targets of opportunity, mostly backed up rolling stock, fifty miles north and south of the target area. 2292 sorties, representing 54 per cent of all FEAF activity during the week, were expended against this target.<sup>47</sup>

Colonel Stewart described the utter destruction achieved when he stated:

At the close of the fifth day, Sinanju-Yongmedong lay smoldering, a reeking mass of gnarled steel, wrenched earth and jagged chunks of concrete torn away and hurled hundred of yards over the landscape. Trains, freight cars and trucks caught between the Taeryong and Chongchon rivers were wholly or partially buried under tons of earth....<sup>48</sup>

Rail traffic through the area was stopped for sixteen days. All eleven of the bridges were unserviceable. Rail congestion was noted in every marshalling yard north of the area. These yards were attacked with excellent results in the weeks following the destruction of the bridges. The Communists must have been hurt. Communist controlled newspapers and radios labeled the attack as an inhuman, barbarous and murderous assault against freedom loving people. The complete destruction of these bridges forced the enemy to build a seventy mile rail bypass around the area. Only

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<sup>47</sup>Stewart, pp. 156-157.

<sup>48</sup>Ibid., p. 157.

three of the bridges were back in operation when the armistice was signed six months later.<sup>49</sup>

The attacks on these bridges had been costly. Seven fighter-bombers and one B29 were lost and twelve aircraft received major damage. Already the mostly highly defended area in North Korea, the Communists doubled their gun emplacements during the seven-day battle. This strong enemy defense and his immediate efforts to both bypass and rehabilitate the area indicated that this coordinated rail attack had been aimed at a most vulnerable spot in their Communist transportation system.<sup>50</sup>

Rail interdiction efforts throughout the rest of the war were sporadic and generally routine. No major effort was made to seriously block enemy rail routes. Small but periodic air attacks were made to keep the rail lines in marginal operating condition.

Rail interdiction efforts during the final two years of the war have been much maligned but some concrete results have to be noted. FEAFF claimed the destruction of over 1000 locomotives and 16,000 railway cars while making over 27,000 rail cuts and destroying nearly 2000 bridges.<sup>51</sup>

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<sup>49</sup>Ibid., pp. 160-164.

<sup>50</sup>USAF Report 127, p. 115.

<sup>51</sup>Weyland, p. 25.



Navy destruction claims during this two year period were  
391 locomotives and nearly 6000 railway cars.<sup>52</sup>

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<sup>52</sup>Cagle, p. 532.

## CHAPTER IX

### ENEMY COUNTERMEASURES

Throughout the rail interdiction campaign the Communist employed various measures to negate or reduce the effectiveness of the United Nations' air operations against his supply lines. Two of these measures, enemy antiaircraft fire and his amazing construction and repair capability, were very effective and should be considered in this study.

#### Air Defense

At the outbreak of hostilities in Korea, the North Koreans possessed very few antiaircraft weapons. It was estimated that they had as few as 36 heavy guns and less than a hundred automatic weapons. This modest arsenal was quickly increased after Communist China entered the war and by July 1951, they possessed 278 heavies and nearly 800 automatic weapons. Intelligence estimates at the end of the war brought this figure up to 720 heavy guns and more than 1300 automatic weapons.<sup>1</sup> The Communist

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<sup>1</sup>Andrew T. Soltys, "Enemy Antiaircraft Defenses of North Korea," Air University Quarterly Review, (Spring, 1954), pp. 78-80.

antiaircraft inventory included Soviet-made 12.7-mm machine guns, 20-, 37-, 40-, and 45-mm light guns and the 85-mm heavy gun.<sup>2</sup>

The heavy guns, the highly mobile 85-mm Soviet, M-1939's, were used to defend the larger marshalling yards and key rail bridges. Initially very few of these guns were radar controlled and this seriously effected their accuracy. In the latter stages of the war, all were radar controlled and this weapons system forced the B29's to go back to high altitude bombing. The primary automatic weapon was the Soviet 37-mm. Automatic weapons and small-arms fire was the primary threat to interdiction aircraft. A full two-thirds of the automatic weapons possessed by the Communist were used to protect his main supply routes.<sup>3</sup>

In comparison with World War II defenses, the Communist antiaircraft artillery establishment was very small. The total Communist gun emplacements were less than the World War II defenses of many major German cities.<sup>4</sup> "For the most part, this gunfire was meager to moderate in intensity. Accuracy was poor, with most fire being delivered by barrage or predicted concentrations."<sup>5</sup> Despite this, the

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<sup>2</sup>USAF Report 72, p. 155.

<sup>3</sup>Soltys, p. 80.

<sup>4</sup>USAF Report 72, p. 155.

<sup>5</sup>Soltys, p. 80.

loss to enemy flak was still the major cause of loss to enemy action. Of the 974 UN aircraft lost to enemy action, 600 were attributed to enemy ground fire.<sup>6</sup>

This is not meant to be an exhaustive study of antiaircraft weapons. The important aspect of the introduction of these weapons into North Korea is the effect that it had on air operations. The following effects are considered significant by the author:

(1) Heavy loss of aircraft for which there were no replacements. The types of aircraft used in the interdiction role in Korea were no longer being produced. Aircraft losses were not replaced and units were conducting operations with less and less aircraft as the war progressed.

(2) Bomb release altitudes were greatly increased. The B29's were forced to attack many targets from altitudes above 20,000 feet, the range of the Soviet 85-mm. Light bombers and fighter-bombers had to stay above the effective range of small-arms fire. In both cases this greatly decreased the bombing accuracy.

(3) The evasive action required to avoid the heavier flak concentrations, also added additional footage to the

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<sup>6</sup>John Dille, Substitute For Victory, (Garden City, New York: Doubleday and Company), p. 63.

circular error.

(4) Finally, some specific targets were so heavily defended that it was impossible to attack them without unprofitable loss.

#### Construction and Repair

The Chinese and North Korean ability to keep their supply lines open in the face of concentrated air efforts against their lines of communication was the biggest factor that limited the effectiveness of the interdiction program. The North Korean Railroad Bureau was responsible for repairing and maintaining the rail lines. This Bureau controlled three brigades of Communist engineering troops, each with 7,700 men. These men formed the cadre for the rail repair gangs. A fifty man detachment of these engineers were stationed at each major rail center while crews of ten men each were located along the rail routes at four mile intervals. The small crews patrolled the four mile stretch of track and when a cut rail or a damaged segment of track was found, they formed work gangs of local civilians and started repairs. Skilled and experienced military work crews were brought in only if the job was too complicated or if heavy equipment was needed. To assist these work

crews, repair materials were prepositioned at convenient spots along the routes.<sup>7</sup>

Repair materials consisted as much as possible of locally available materials such as lumber or rock. Repairs accomplished were crude but effective: Wide and deep bomb craters were refilled or shored up with a framework of lumber crossties. Rails were heated and bent back into shape and relaid. FEAF estimated temporary repairs of this nature were completed in from two to six hours. These crude repairs would not stand up to normal traffic tonnage but it would allow a few light-weight trains to get through until more permanent repairs could be completed.<sup>8</sup>

The repair of railway bridges and the construction of bypass bridges around them was the major task of the Railroad Bureau. Repair of rail line cuts or damage rail beds was minor in comparison with the repair required to keep the key rail bridges in operation.

The outstanding feature of this bridge repair program was its complete simplicity. Repairs made were certainly inadequate by normal standard and although, the bridges might not be able to support a full tonnage load, it was at least opened to limited traffic in minimum time.

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<sup>7</sup>USAF Report 72, p. 156.

<sup>8</sup>Ibid., p. 157.

The Communist used every shortcut in the book. Fill material was extended as far out from each bank as possible. The span of the bridge then is built over the deep part of the river only. Wooden spans were prefabricated and stored near every major bridge. Little evidence of the use of steel, except for rails, was noted. Concrete piers were reinforced with sandbags and wooden replacement piers were built up to the water level even before the bridge was damaged. These wooden piers, unique in rail bridge construction, were merely railroad ties laid on each other to form a hollow square with the center being filled with sandbags.<sup>9</sup>

When the damage was restricted to the replacing of steel spans, these spans were generally cannibalized from another nearby bridge that was not in operation. About 95 per cent of the major steel bridges employed a deck-girder span, most of them uniform in size.<sup>10</sup> The three pictures of the Yongmedong bridges on pages 119, 120 and 121 is an excellent example of the interchange of spans to keep one line open. The first picture, page 119, taken on 3 July 1952, shows both bridges usable. The second photograph, on page 120, was taken after the bridges had been bombed on 5 July. It shows two spans knocked out on the

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<sup>9</sup>Kozaczka, pp. 192-195.

<sup>10</sup>Ibid., p. 193.

west end of the north bridge while two spans are out on the east end of the south bridge. The photograph on page 121, taken on 8 July, shows the north bridge back in use and it is easy to see where two spans were removed from the south bridge to replace the destroyed spans in the north bridge.

Bypass bridges were started prior to the destruction of the main bridge. Nearly every bridge in North Korea had at least one bypass. This meant that we had to knock out two or even three bridges to fully stop the traffic.<sup>11</sup> Aerial photographs of the Sinanju and Sunchon bridge complexes on pages 122 and 123 indicate the large number of bypass bridges that were built around each key bridge. In January 1953, there were eleven bridges in a two-mile by four-mile area between Sinanju and Yongme-dong.

The ability of the Communist to keep their rail lines open in the face of these heavy attacks was one of the major factor which limited the success of rail interdiction during the final two years of the war. Major Kozaczka gives his view on how it was done:

This was not the result of any secret equipment or any new radical techniques, but must rather be attributed to the ingenuous and effective use of crude materials and equipment by hordes of apparently well directed, hard working laborers.<sup>12</sup>

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<sup>11</sup>Ibid., p. 198.

<sup>12</sup>Ibid., p. 190.



NE BRIDGE SERV  
YD 198928

NW BRIDGE SERV  
YD 197927

YONGMI-DONG BRIDGES  
3 JULY 52

**YONGMI-DONG BRIDGES**  
**5 JULY 52**

**TWO SPANS OUT**

**NE BRIDGE U/S**  
**YD 198920**

**NW BRIDGE U/S**  
**YD 197927**

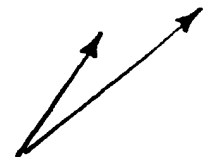
**TWO SPANS OUT**

NE BRIDGE  
HAS BEEN  
REPAIRED      SERV

TWO SPANS HAVE  
BEEN REMOVED

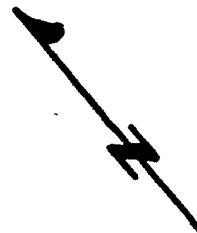


NW BRIDGE U/S



SPANS STILL  
MISSING

YONGMI-DONG BRIDGES  
8 JULY 52



THE RAIL BY-PASS BRIDGE is located west of the  
main bridge. Destruction of this By-Pass bridge is neces-  
sary to prevent the enemy efforts of re-supply. The enemy is  
making every effort possible to maintain a bridge across the  
river at strategic for movement of vital supplies by rail.





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1. SUNGCHON RR BY CLASS BRIDGE is located along the  
2. main line running from MANPOUJIN to PYONGGYANG. It is 100  
3. meters long. This bridge would completely disrupt the country's main  
4. rail line and would be a crippling blow to the country's supply  
5. system. It is a strategic target and should be destroyed.

## CHAPTER X

### INTERDICTION IN RETROSPECT

The intensive United Nations' air operations against North Korea rail lines is one of the most controversial issues of the entire war. Rail interdiction critics pronounced it a dismal failure while its advocates insist that it was the decisive use of airpower in Korea. The views of most military strategists and historians generally lie somewhere in between these two extremes. The multiple purposes of this chapter are:

(1) to establish an understanding of the critical need for a comprehensive rail interdiction program;

(2) to point out some inherent weaknesses of this type campaign;

(3) to evaluate the effectiveness of the various applications of airpower during the interdiction campaign in Korea;

(4) to evaluate the success or failure of the overall Korean rail interdiction program; and, finally,

(5) to make recommendations as to the future use of airpower in an interdiction role.

A modern military force is completely dependent upon its means of transportation. The modern soldier no longer walks to the battlefield, nor does he carry his weapons and supplies on his back. The late Sir Winston Churchill, in his classic, "The River War," wrote of transportation in the following manner:

In a tale of war, the reader's mind is filled with the fighting. The battle--with its vivid scenes, its moving incidents, its plain and tremendous results--excites imagination and commands attention. The eye is fixed on the fighting brigades as they move amid the smoke; on the swarming figures of the enemy; on the General, serene and determined, mounted in the middle of his staff. The long trailing line of communications is unnoticed. The fierce glory that plays on red, triumphant bayonets dazzle the observer; nor does he care to look behind to where, along a thousand miles of rail, road, and river, the convoys are crawling to the front in uninterrupted succession. Victory is the beautiful, bright-coloured flower. Transport is the stem without which it could never have blossomed.

Although anachronistic, this statement is still very true. Too often the military planner merely "assumes" this transportation capability.

The early destruction of the limited war industry in North Korea made the Communist forces even more dependent upon a transportation means to supply its forces.<sup>1</sup> The great load-hauling capacity of the North Korean railway network and the complete inadequacy of the road system clearly made railroads the primary transportation capability of the

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<sup>1</sup>Kozaczka, p. 193.

enemy. This method of transportation also, was less expensive since gasoline had to be imported from China or Russia while coal was locally available.<sup>2</sup>

On the basis of this evaluation of the Communist means of transportation, FEAF determined that the North Korean railroad system was of supreme importance to the Communists. Past experience had proven that rail interdiction was preferable to road interdiction. Rail lines can not be hidden, nor can rail traffic be as easily diverted to secondary routes or detours as could motor vehicles.<sup>3</sup>

On the negative side of rail interdiction, some inherent weaknesses stand out. First, most rail systems have a greater capability than is normally required to support a military operation. A large portion of the enemy's rail system must be destroyed before it really begins to seriously hurt his military operations. Sir John Slessor stated it this way:

The fact is that, especially if you don't give a damn about the civilian population and are prepared to use all the transportation resources on hand (and, incidentally, forced civilian labor) for purely military forces, the proportion of the transportation potential....which is required to meet the minimum needs of the Army and Air Forces is so small that you have, so to speak, a tremendous cushion against

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<sup>2</sup>Futrell, p. 405.

<sup>3</sup>Ibid.



interference with military supply....after all, four or five thousand tons a day does not represent many train loads.<sup>4</sup>

Secondly, due to the close proximity of most civilian marshalling yards and railway bridges to the heavily populated cities, very heavy damage and many civilian casualties are invariably inflicted in the process of destroying the targets. This highly unattractive and yet unavoidable by-product of the destruction of these targets seriously limits its use. Humanitarian reasons require a careful weighing of results against civilian casualties inflicted. This aspect of rail interdiction is practically prohibited in once friendly and now occupied nations.<sup>5</sup> Aerial photographs on the next four pages indicate the vast destruction of the North Korean marshalling yards. The bombing patterns are generally good but it is obvious that substantial damage has been done to areas adjacent to the yards.

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<sup>4</sup>Slessor, p. 572.

<sup>5</sup>Craven, p. 73.

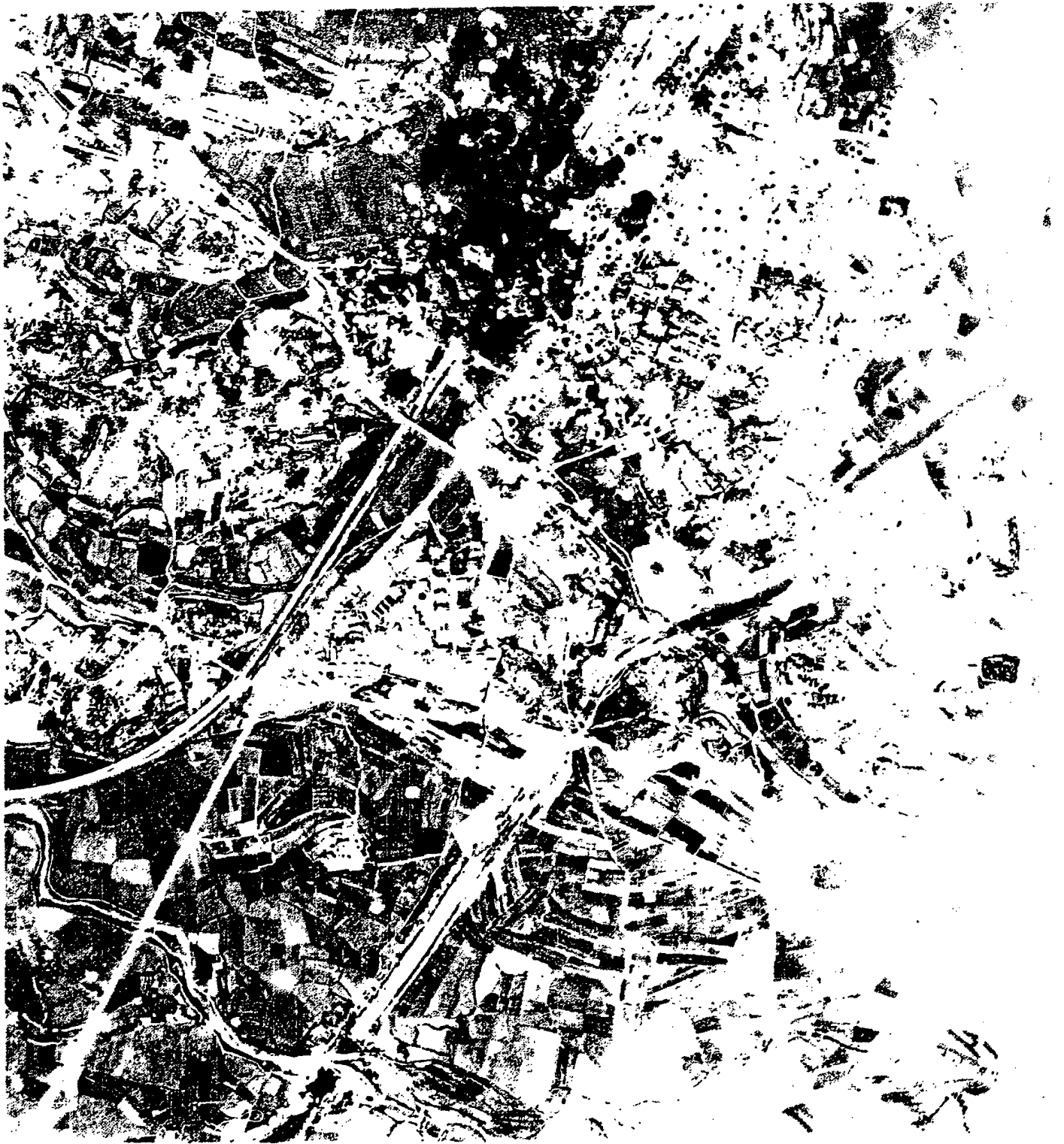
Vertical text columns on the left side of the page, likely bleed-through from the reverse side. The text is highly degraded and mostly illegible, appearing as a series of dark, blocky shapes.

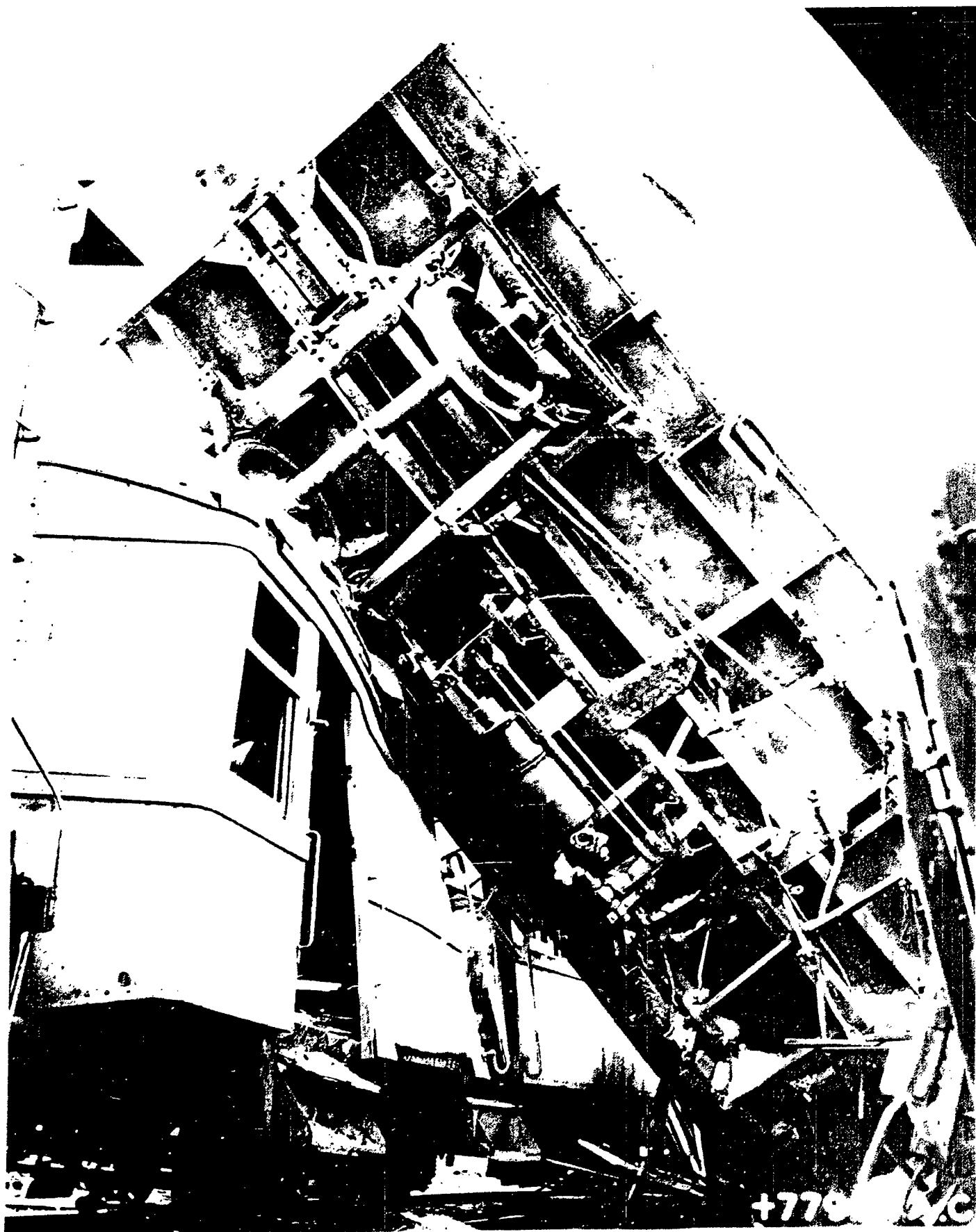




### SUNCHON MARSHALLING YARD

A strike was made on a North Korean ship yard by the 98th Bombardment Wing on 22 August 1950.





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### Evaluation of Specific Campaigns

Rail interdiction authorities generally agree that an effective bridge destruction program is the most reliable method of interdicting an enemy's railroad transportation system. The success or failure of a bridge program is directly proportional to the ability to destroy a bridge and to keep it in an unusable status. The initial bridge destruction program was very effective. The bridges selected for destruction were smaller and of a lighter construction than the bridges over the Yalu. Very little enemy opposition either by antiaircraft guns or enemy air was encountered. It became strictly a bombing problem. The 1000-pound and the 2000-pound bombs were heavy enough to knock out a span on the bridges if a hit was scored. Early enemy capability to repair or bypass these bridges was also limited.

The campaign against the Yalu bridges and the bridge complex at Sinenju-Yongmedong was a different story. These bridges were of very heavy permanent construction. Direct hits by the largest bombs in use often only damaged a minor span. The Communists moved in hundreds of both heavy AA guns and automatic weapons. Heavy flak was encountered during attacks on these bridges. Enemy air opposition precluded mass daylight attacks against bridges. The

inability to precisely pinpoint the location of the bridges made it impractical to attack them at night using SHORAN. The final factor that reduced the effectiveness of the bridge destruction program was the amazing ability of the Communists to either repair the bridges or to quickly construct bypasses around them.

As indicated in the three photographs that follow, many railroad bridges were completely destroyed. Over seventy per cent of all rail bridges 300 feet in length or longer were unserviceable when the Armistice was signed.<sup>6</sup>

The attacks against the marshalling yards of North Korea were very successful. By the end of the first year of the war all major marshalling yards with the exception of Rashin had been bombed out of operations. The yards at Rashin were destroyed in August 1951. The Communist reaction to the loss of these yards was to construct thousands of little two-track sidings throughout their rail net. These small yards would generally not hold more than five cars and they were used for minor repair only. All repairs of a major nature were accomplished in Manchuria. Interrogation of Korean POW's indicated that a badly damaged locomotive or boxcar was often out of operation for at least seven months. There is little question that this aspect of

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<sup>6</sup>Kozaczka, p. 193.



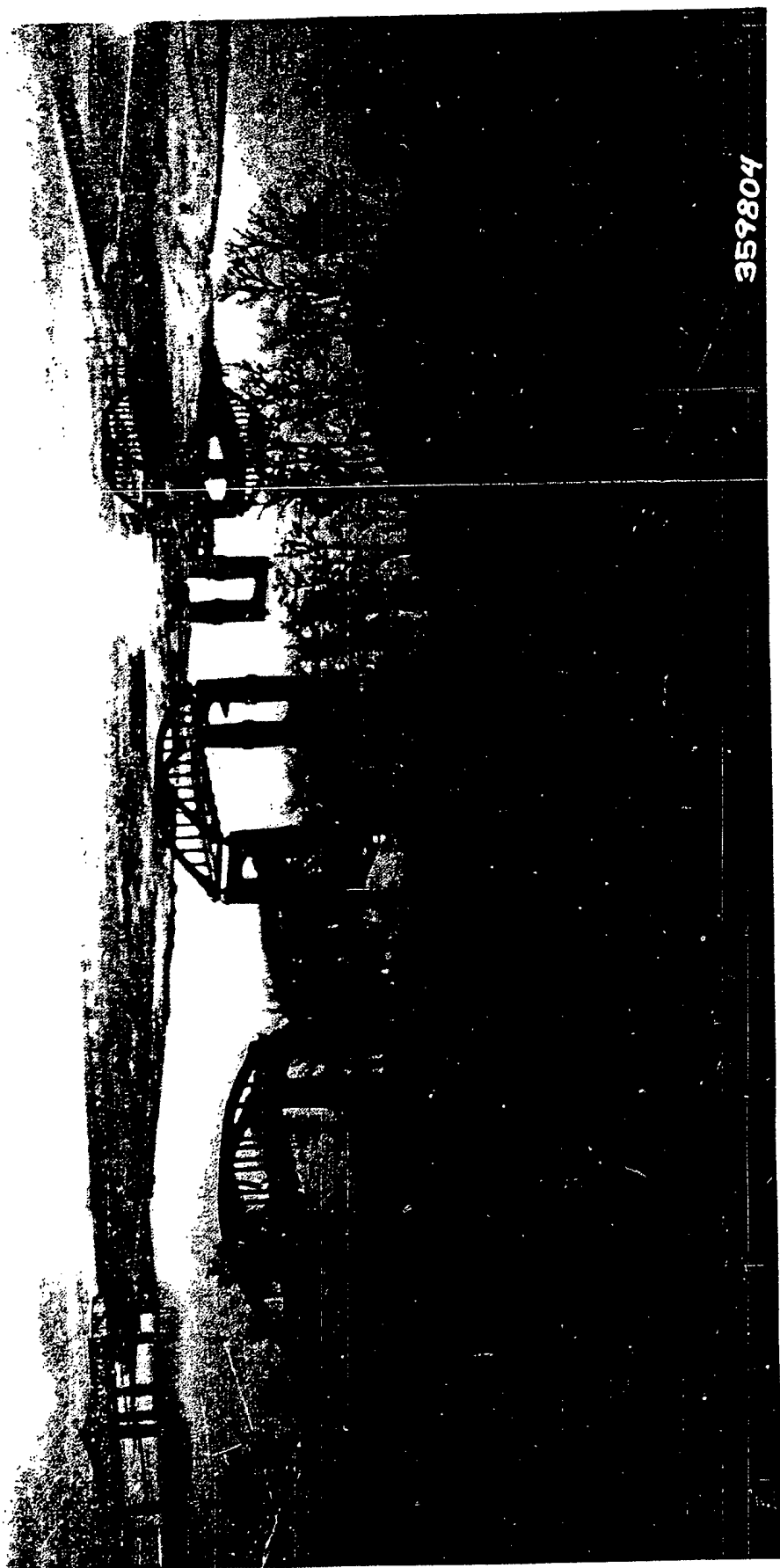
THE BUREAU OF THE ARMY

WASHINGTON, D. C.

OFFICE OF THE CHIEF OF ENGINEERS







359804

the interdiction program hurt the Communists very badly.

Rail interdiction activities during STRANGLE did a great amount of damage to the enemy rail network but the operation was not considered successful in proportion to the air effort involved. The 60 mile wide zone selected for STRANGLE was just too narrow for effective interdiction. As covered in detail on page 90 of this study, two other items contributed to the failure of STRANGLE. First, the failure to destroy the Yalu bridges and, secondly, the failure to completely interdict the three main routes in MIG Alley.

The failure of STRANGLE caused the implementation of SATURATE, a program designed for round-the-clock concentration of available railway-interdiction effort against short segments of track. Two-mile stretches of track were completely pulverized. This approach to rail cutting was very effective in the area where it was applied. There was just not enough aircraft and ordnance in FEAF to establish these SATURATION points on all the major rail lines. Using all the fighter-bombers available, including Navy and Marine aircraft, it would be possible to maintain six of these points. This is only about a third of what would be needed to fully interdict North Korea.

Interdiction attacks against locomotives and freight cars were highly successful when the attack was made during daylight hours. The degree of effectiveness of night attacks is largely conjecture. There is little doubt that the claims of the crews were inflated. The differences of opinion on the subject is only on the degree of inflation. Throughout the war the Air Force lacked a good method of ascertaining the results of these night attacks. Photo-reconnaissance aircraft were employed to confirm any claim of a locomotive destruction but too often the crew could not precisely pinpoint the place where the attack had taken place. This made photo confirmation very difficult and resulted in the following announced policy. "Railroad equipment could be claimed as destroyed if it exploded, burned intensely, or was derailed in an area where recovery was doubtful or improbable."<sup>7</sup> It is easy to see that this system of accountability was not only inaccurate but it encouraged the crews to make doubtful claims. Stiff competition between crews in a squadron and between squadrons in a group also added to these inflated claims. The group in which the author served daily announced a "tiger of the night." This was the crew from the previous night's missions who claimed the most destruction. Five locomotive

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<sup>7</sup>Futrell, p. 299.

destructions resulted in one's being designated a "Loco-Ace." This inability to assess the effectiveness of night armed reconnaissance was one of the major weaknesses of the entire interdiction program.

#### Effectiveness Evaluation

Many factors detracted from the effectiveness of the rail interdiction program. Before making an evaluation of this effectiveness, the following factors should be discussed:

(1) Command and control deficiencies. The relationship of FEAF to its superior headquarters, General MacArthur's Far East Command, and to the Army and Navy forces in the theater vitally affected the conduct of the air war in Korea. "The command structure in the Far East at the outbreak of Korean hostilities was actually little more than a relic of General MacArthur's World War II structure." Although, on 14 December 1946, the JCS had directed that a joint staff be formed in the Far East, this was not done.<sup>8</sup> Nearly three years elapsed before General MacArthur took cognizance of this order, and then, on 20 August 1949, he belatedly formed a Joint Strategic Plans and Operations Group (JSPOG) under the Theater Assistant Chief of Staff for Operations. The mission

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<sup>8</sup>USAF Report 71, p. 9.

assigned the JSPOG was "to assist and advise the Commander-in-Chief, Far East, on matters pertaining to his exercise of unified command over Army, Navy and Air Force forces, allocated to the Far East Command."<sup>9</sup> It was soon apparent, both from the mission statement above and from the fact that there were only eight officers on the JSPOG, that it could not serve in lieu of a joint staff as directed by the JCS. This was the situation that existed at the start of the Korean War. An Army Target Board selected targets for all air sorties. Army GHQ at Tokyo was the approval authority for close support requests. Processing of these requests often took as long as six hours. 329 medium bombers scheduled to bomb the Han River bridges were diverted to close support. Fighter-bombers scheduled to standby for close support missions were directed against the bridges. It was not until the middle of July that FEAF was given any control over air operations.<sup>10</sup>

Doctor Futrell summed up the situation when he wrote the following:

Belatedly, at the end of July, improvised procedures brought some order to the fantastically confused command situation in the Far East, but these extempore arrangements never achieved the full fruits of unification. Certainly, at the outset of the Korean War, the defective theater

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<sup>9</sup>Futrell, p. 43.

<sup>10</sup>Ibid., pp. 43-51.

command system prevented the fullest employment of airpower, delayed the beginning of a comprehensive air-interdiction program for more than a month, and, as will be seen, caused confusion and loss of effectiveness at the very time that every single aircraft sortie was vital to the survival of the Eighth Army in Korea. Had he possessed a joint headquarters staff, General MacArthur might never have encountered these mischievous problems. Lt. General Weyland, writing on 10 October 1950, said one conclusion was inescapable: "Whenever combinations of Air Force, Army, and Navy are in a joint command, it is essential that the Commander-in-Chief have a joint staff with proportionate representation of the services involved.<sup>11</sup>

Aircraft direction and control was another factor that adversely effected the interdiction program. No single agency was given the full responsibility and authority for the direction and control of all aircraft used in the combat theater. Initially the control was exercised from the JOC in Tokyo. On 5 July 1950, FEAF established a JOC at the 24th Division Headquarters at Taejon, Lorea. The equipment provided them was hopelessly inadequate. A single VHF radio and a land-line telephone and teletype to Fifth Air Force Advance was provided. Interdiction sorties were scheduled by the parent wing or group without regard to the operations of any other unit. Strikes against one target were often duplicated while another target was not hit at all. The arrival of the carrier "Valley Forge" added to the confusion. Navy fighter-bombers attack targets at

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<sup>11</sup>Ibid., p. 55.

random without regard for or coordination with FEAF activities in the area. Further, the inflight radio equipment of Navy aircraft was not compatible with Air Force equipment. Admiral Joy, NAVFE Commander, would only agree that the Air Force should have "coordination control," a term still undefined, over Navy aircraft.<sup>12</sup> It was not until nearly six months after the war started that any degree of coordination between Air Force and Navy aircraft was affected.<sup>13</sup> Operation SATURATE, initiated in March 1952, was the first effort where anywhere near full coordination was achieved.<sup>14</sup>

(2) Lack of continuity. The second major factor which adversely effected the rail interdiction program was the complete lack of continuity. "In order to achieve desired results, any air interdiction campaign must be well planned as to objectives and persistently sustained in its execution."<sup>15</sup> The Navy never fully appreciated the value of long range interdiction and much preferred to employ its air effort in a close support role. As an example of this lack of conviction in the interdiction program, on 25 December 1950, Vice Admiral Struble, Commander of Navy Task Force 77,

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<sup>12</sup>USAF Report 72, pp. 24-28.

<sup>13</sup>Cagle, p. 268.

<sup>14</sup>Putrell, p. 416.

<sup>15</sup>Ibid., p. 117.



requested that the services of the carriers be used to provide close air support to the U.S. Eighth Army's east flank. General Ridgway denied this and directed that the Navy "interdict the east coastal rail lines from the bomb-line as far north as possible."<sup>16</sup> Admiral Struble still did not agree with this directive and sent the following message to General Ridgway:

Without detracting from the value of armed reconnaissance and interdiction in some measure to prevent the transportation of troop, equipment and supplies to the enemy front lines, previous experience here in Korea has demonstrated that under the conditions existing, the results obtained from such operations are only partial. In my opinion, close air support....will do more to hurt the enemy potential than any other type of operation in which we can participate at this time.<sup>17</sup>

General Ridgway was unconvinced and directed the Navy to resume the interdiction of the east coast rail lines. Whether by design or by the necessities of war, Navy efforts were directed at interdiction targets less than fifty per cent of the time throughout the war.<sup>18</sup> This intermittent application of interdiction effort was bound to leave gaps in the program.<sup>19</sup>

The degree of Air Force efforts also fluctuated. Most senior Air Force commanders agreed that a substantial

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<sup>16</sup>Cagle, p. 229.

<sup>17</sup>Ibid., p. 230.

<sup>18</sup>Futrell, p. 287.

<sup>19</sup>Cagle, p. 228.

portion of the available air effort should be used for interdiction but too often the overall ground effort was so critical that all sorties were directed at close support targets. This was particularly true during the first year of the war. The limited airpower available often necessitated that the complete Air Force forces be used in close support. This is as it should be, but it does seriously detract from the interdiction program. This very reasonably leads into the third major factor limiting the rail interdiction program in Korea.

(3) Limited aircraft availability. The concentration of hostile ground fire along the North Korean railroads took a heavy and increasing toll of United Nations aircraft during the last two years of the war: For example, 26 lost and 24 damaged in August 1951, 32 lost and 233 damaged in September, 33 lost and 238 damaged in October and 24 lost and 255 damaged in November. By April 1952 FFAF had received only 131 replacement aircraft of the type engaged in interdiction against the 43 it had lost and the 290 that had received major damage. All units operated well below minimum strength during the entire war.<sup>20</sup> Operation SATURATE, the most effective of the various uses of aircraft in an interdiction role, failed because of the lack of available aircraft.<sup>21</sup> During this period, when "massive retaliation" was the

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<sup>20</sup>USAF Report 72, p. 156.

<sup>21</sup>Putrell, p. 418.

primary deterrent to global war, only so many aircraft could be released to this "police action" in Korea. Aircraft that were used, with the exception of the MIG-killing F86D, were generally outmoded and obsolete. Replacements were just not available. This lack of availability and obsolescence of aircraft is directly responsible for the fourth factor contributing to a loss of effectiveness in rail interdiction.

(4) Lack of an effective night capability. During World War II the Air Force had pointed out the requirement for developing an effective night-intruder interdiction aircraft.<sup>22</sup> This serious deficiency still existed in fighting the Korean War with old World War II aircraft. The true results of night interdiction missions are very difficult to ascertain. The predominance of night movement of both rail and road traffic certainly indicate that the night efforts were not as effective as the day efforts. Post war analysis indicates that crew claims were exaggerated and that the program was not as effective as first believed. It is felt by many that the biggest effect achieved by this night harassment was that it greatly slowed down the movement of vehicles. There is little doubt that the Communist could move supplies and personnel forward at night if they were willing to pay the cost in

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<sup>22</sup>Craven, p. 290.

lost equipment and personnel.

(5) Communist countermeasures. The ability of the Chinese and the North Koreans to keep their rail lines operative in the face of constant air attacks was nothing short of phenomenal. As discussed in Chapter Nine, the Communist matched his unlimited manpower against our technical ability to destroy his rail network and the results were about a draw. His well organized recovery programs managed to match the UN air forces cut for cut. This high degree of tenacity and determination has seldom been equalled in modern armies. Major Kozaczka stated this as follows:

Against an enemy repair organization with this caliber of planning, organization and high adaptability, an interdiction campaign conducted under present restrictions can never achieve its goal of complete denial of resupply to the enemy. But it can and does make him pay a heavy price for every pound that gets through.<sup>23</sup>

(6) Lack of strategic depth. An integral part of any successful interdiction program is the destruction of a large portion of the enemy's supply capability at its source. This facet of the program was denied the UN air forces during the Korean War. The limited war-making capability of North Korea had been destroyed during the first few months of the war. Thereafter most of the equipment used was produced in and transported from Communist China. All of the larger supply facilities

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<sup>23</sup>Kozaczka, p. 201.

were north of the Yalu. Had the UN air forces been given the authority to attack these supply points and the industrial sites which produced this equipment, the results of the interdiction program would have been much more decisive.

(7) The static ground situation. A basic requirement for the success of an interdiction effort is that the ground forces in contact with the enemy place pressure on him to make him use his supplies and forces at an accelerated rate. This was not true during the final two years of the war. Diplomatic restrictions placed upon the UN ground forces did not permit them to seek a decisive victory. A major UN offensive during this static phase would have forced the Communist to expend his supplies faster than he could replace them. Then, and only then, would the true value and potential of an interdiction program be realized.

### Summary

Analysis of the Korean rail interdiction program revealed seven major factors that limited its effectiveness. The factors were: first, lack of an adequate command and control structure - second, a lack of continuity - third, insufficient airpower - fourth, inability of the air forces to prevent night movement - fifth, the fantastic capability of the Communists to keep their rail lines open - sixth, the limited strategic depth of the area of operations - and lastly, the lull in the ground fighting which permitted the enemy to operate with minimum supplies.

Despite these limitations it is believed by the author that the overall program was successful. The purpose of an interdiction program is to prevent the enemy from massing sufficient supplies and personnel to launch and sustain a major offensive and to deny him the capability to conduct an offensive defense against a major attack. This purpose was accomplished. The Communist possessed a numerical superiority throughout the war. They were still not capable of maintaining the impetus of an offensive once it was started. General Bonner Feller, U.S. Army retired, stated it this way:

....United Nations' ground forces were never permitted to seek a decision. However, because of our air attacks south of the Yalu, the Communist forces were never able to amass enough supplies to sustain a major ground effort, although they had ample troop strength to support one....<sup>24</sup>

In arriving at this conclusion the author has considered the wise guidance of Sir John Slessor who emphasized the things that airpower cannot be expected to do. They include:

(1) It cannot by itself defeat a highly organized and disciplined army, even when that army is virtually without air support of its own.

(2) It cannot by itself enforce a withdrawal by drying up the flow of essential supplies. In short, it cannot absolutely isolate the battlefield from enemy supply or reinforcement.

(3) It cannot entirely prevent the movement of strategic reserves to the battlefront.<sup>25</sup>

It must be granted that the interdiction program did not do as much as its loudest advocates said that it would. However, it was still an effective force in gaining the overall objective. In conclusion the following seems appropriate

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<sup>24</sup>Bonner Fellers, "A New Look at War," Air University Quarterly Review, (Winter, 1953), p. 17.

<sup>25</sup>Slessor, p. 580.

Although the UN railway interdiction operations were limited by geographical area of application, force capability, and politico-military situation, they achieved their stated purpose; if they lacked the military effect which possibly could have been attained by other operations, they nevertheless conformed with contemporary climate of world opinion which desired a cease-fire in Korea.<sup>26</sup>

### Recommendations

This evaluation of the Korean rail interdiction campaign provides sufficient background information from which we can assess the capabilities which existed during the Korean War and to translate these capabilities into actions for the future. In an attempt to improve our interdiction effectiveness, the following recommendations are made:

(1) All available military forces must be combined in a concentrated and continuous effort to prevent the enemy from moving his supplies and forces. This integrated effort would require that the Navy blockade the enemy's ports and prevent his use of sea lines of communication. The ground forces must maintain constant pressure on him to make him use his supplies at an accelerated rate. The air forces must destroy his strategic war making capabilities while preventing his movement to and from the battlefield. All three of these requirements must be applied to insure

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<sup>26</sup>USAF Report 72, p. 162.



the collapse of his logistic capability.

(2) Theater commanders must utilize a compatible organization and command structure such as the one provided for in the Unified Action Armed Forces (UNAAF) Joint Chief of Staff Publication No. 2 to secure and maintain positive and integrated control of all combat aircraft in the theater of operations.

(3) The interdiction effort must be continuous. Lulls in the program give the enemy time to stockpile needed supplies and to repair and improve his transportation means.

(4) The air interdiction program must be very broad in application. All methods of interdiction must be concurrently employed. Bridges and marshalling yards must be destroyed, rail and road cuts made and armed reconnaissance flown throughout the war.

(5) A 24 hour a day capability must be developed. It is of little value to stop his daylight movement if he is allowed to move freely at night. On 15 April 1951, General Partridge said: "I believe that the paramount deficiency of the USAF today....is our inability to effectively seek out and destroy the enemy at night."<sup>27</sup> This deficiency still exists.

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<sup>27</sup>Futrell, p. 297.

(6) Air superiority in the interdiction area must be maintained. Conventional propeller-driven aircraft and the slower fighter-bombers are usually assigned the interdiction mission. These aircraft cannot survive in an area controlled by enemy jet fighters.

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